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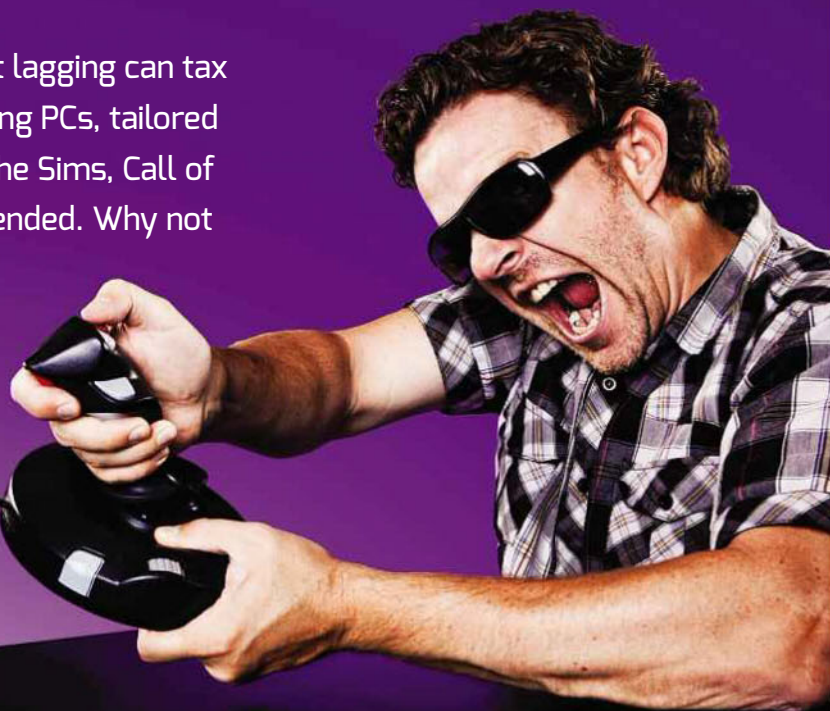
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08 Web Filtering

Estimates of how much of the internet is made up of pornography vary wildly, but it's probably safe to say there's a lot of it. That's why the government brought in legislation requiring ISPs to make access to adult content an opt-in rather than an opt-out. However, as David Crookes explains, it's not just porn that's being blocked – and not everyone is happy about the measures

18 Technology For Under £50

We're into February, but it's likely that some of us are still feeling the pinch after Christmas. That doesn't necessarily mean you can't treat yourself to a new bit of kit, though. That's why we've put this guide together looking at all kinds of technology you can buy for less than £50, from keyboards and mice to hard drives and speakers

46 Four-bay NAS Drives

Network storage offers a whole host of useful features, including sharing media files around your home and even over the internet. What's more, with hard drive prices so low right now, even home users can afford to try out a multi-disk solution. David Hayward has been looking at six options, and putting them through their paces

56 Top Indie Games Of 2014

Last year offered plenty of big budget PC games that could make even a decent graphics card weep in shame. There were many real gems from the independent sector too, though. James Hunt picks out some of the best alternative offerings from last year, and also some to watch out for

56 Top Indie Games Of 2014

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60 Performance Laptops

High-performance laptops used to cost a ton, often coming in at several thousand pounds, but these days you can get something that can play games and breeze right through video editing at a price that won't mean applying for a loan from the IMF. To give you an idea of what's available, we've chosen five portables that we think fit the bill. Maybe one of them will be ideal for you?

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For decades, TV networks had things their way, charging thousands and thousands of pounds for advertising slots and dictating how shows were broadcast and when they would be axed. Now, of course, the internet and services like Netflix are changing that – and the way people want to consume media is going against traditional models. With the spectre of net neutrality hanging over us, though, the switch to digital service could be less than easy

70 Music Apps For iOS

When you think of Apple and music, iTunes will naturally come to mind, but there are plenty of other music apps for iPhones and iPads. Some of them are just as good as, if not better than, iTunes – and Keir Thomas has been looking at what's available and seeing what they have to offer

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What Is Your ISP Hiding?

Sky Broadband's 'porn' filter is now turned on by default. But why, and what are the other major ISPs doing? David Crookes examines a changing approach to internet access

Each year, Google releases an annual round-up of the year's top global searches. In 2014, it listed the World Cup, Ebola, Robin Williams, the Ice Bucket Challenge and Flappy Bird – but it didn't list pornography. It's not unusual for 'porn' to be left out. Millions of people around the world tap that term into their computers en masse so including it in these lists would incite boredom: the round-ups would invariably be the same, day after day, month after month and year after year.

Porn is a mainstay of the internet. It is a phenomena that we know exists, is readily available and has audiences eager to view. Figures released to the press by net filtering company Optenet in June 2010 suggested 37% of the internet is made up of pornographic material. And while that figure has been open to dispute (academics in 2013 estimated more conservatively at 4%), there is no doubting that the presence of porn and the ease with which young people are able to access it has long been cause for concern.

On 22nd July 2013, Prime Minister David Cameron made a speech to the NSPCC in which he talked about cracking down on online pornography and making the internet safer for kids. He said the web was having an impact "on the innocence of our children" and was "corroding childhood". "In the darkest corners of the internet, there are things going on that are a direct danger to our children and that must be stamped out," he continued, saying the impact of the internet was too big to ignore.

Cameron added there were two challenges facing the UK when it comes to the protection of children. The first was criminal – the proliferation and accessibility of child abuse images on the internet – and the second was cultural. He pointed to the numbers of children that were viewing porn online and were, as a consequence, having a distorted view of sex and relationships.

Speech

The internet and pornography: Prime Minister calls for action

From: Cabinet Office, Prime Minister's Office, 10 Downing Street and The Rt Hon David Cameron MP
Delivered on: 22 July 2013 (Transcript of the speech, exactly as it was delivered)
First published: 22 July 2013
Last updated: 24 July 2013, [see all updates](#)

David Cameron made a speech about cracking down on online pornography and making the internet safer for children on 22 July 2013.



Thank you to the NSPCC for hosting me today and thank you for all the amazing work you do for Britain's children.

Today I am going to tread into territory that can be hard for our society to confront. It is frankly difficult for politicians to talk about, but I believe we need to address as a matter of urgency.

I want to talk about the internet, the impact it's having on the innocence of our children, how online pornography is corroding childhood and how, in the darkest corners of the internet, there are things going on that are a direct danger to our children and that must be stamped out. Now, I'm not making this speech because I want to moralise or scaremonger but because I feel

And while he said parents needed to take a more proactive stance in monitoring their children, he also stated an intention to give the issue a technological helping hand.

In particular, Cameron had a fair few interesting things to say about the role he wanted ISPs to play, all which boiled down, in short, to his desire to have family-friendly filters automatically applied within homes up and down the UK. He wanted to get internet usage to such a point that the only way for someone to access adult material would be to indicate to an ISP that they wanted to see it.

"When someone sets up a new broadband account, the settings to install family-friendly filters will be automatically selected: if you just click next or enter, then the filters are automatically on," Cameron continued as he earmarked the big four ISPs – BT Broadband, TalkTalk, Sky and Virgin – in his bid to role out the scheme.

Those four have reacted positively to Cameron's pledge. But the Prime Minister's approach to filtering – his desire for an opt-out scheme as opposed to opt-in – has been controversial ever since. The stakes were raised even higher when, on 20th January 2015, Sky Broadband hit the headlines with an announcement of a default family-friendly filter.

Pre-ticking

Suddenly, Cameron's ever-present filter was a reality, although it is common now for broadband companies when signing new customers to ask if they want a filter and often the 'yes' box is pre-ticked ("The pre-ticked prompt should be presented to the consumer in such a way that it cannot be ignored by the consumer, who has to make an 'unavoidable choice' as to whether to turn the family-friendly network level filtering on or off," says Ofcom's report on internet safety measures published on 22nd July 2014).

The details of Sky Broadband's decision were included in a widely publicised blog post written by Lyssa McGowan, brand director of communications products at Sky Broadband. She said the company intended to block sites that are deemed unsuitable for those aged 13 and under, and that emails were being sent out to customers to explain the company's position, "giving them the opportunity to make a decision one way or the other."

Mobile Protection

The filters that ISPs are encouraging customers to sign up to with emails, pop-ups and tick-boxes upon contract purchases apply to home broadband. When it comes to mobile phones, restrictions have been in place for some time.

Smartphones are akin to mini-computers, so mobile phone companies have moved to protect users. The firms must have internet filters that remove the risk of children accessing pornography. The filter will be automatically applied if the phone is registered to a child user. This will restrict content to that rated 18 and over.

Of course, if the phone is registered in the name of an adult, these rules don't apply. Filters can be placed on the web by requesting such a service from the provider. It is important, therefore, to be careful when passing a used phone down to a child: if you want them to be protected when they're going online, give the mobile company a ring and ask them to apply the filter.

Ofcom

Ofcom Report on Internet safety measures

Internet Service Providers: Network level filtering measures

Publication date: 22 July 2014

The sites involved are rather broad, and they extend beyond pornography to include alcohol, drugs, gambling, anorexia and self harm. The only way customers will be able to view these kinds of sites is by specifying that they want the restrictions lifted.

It is clear to see why the remit has been widened out. There have been terribly sad stories of children visiting suicide and self-harm sites, and there are horrible forums that have either discussed the best ways to die or encouraged self-destructive behaviour. Warped websites that promote eating disorders have been on the rise, and Prof. Mark Griffiths, director of the International Gaming Research Unit based at Nottingham Trent University, said large numbers of

“ There have been terribly sad stories of children visiting suicide and self-harm sites ”

teenagers were hooked on games played through social media websites and were becoming addicted to gambling as a result.

All of these will be caught in Sky's default filter, which goes by the name of Sky Broadband Shield, a service that uses site classification supplied by Symantec and is based on Xerocolle technology. Set up in November 2013, it has already been active in protecting against malware-infected or phishing sites.

Making Inroads

The problem is that, according to a report by Ofcom that was published in July 2014, Sky Broadband has been rather ineffective in its bid to make inroads with Shield into its customer base. Despite an extensive marketing campaign in which the broadcaster used characters from the Marvel Comic Book series to emphasise the usefulness of the filter, take-up of Shield by new Sky Broadband customers was just 8%. That fared better than BT Broadband (5%)

and Virgin Media (4%), but it was worse than TalkTalk at 36%, and Sky Broadband wanted to achieve a higher figure. It looks like that will happen overnight with the shift towards the opt-out policy, although the company told Micro Mart it was too early to tell.

So how does it all work? Sky Broadband Shield has an adjustable range of age rating options from PG to 13, 18 to Custom and none for different times of the day. Customers are able to log in at **broadbandshield.sky.com/choice** and make a decision. Those that do not do anything will see filters apply to their internet usage. “When trying to visit a website deemed unsuitable for children under the age of 13 during the day, customers will see a page reminding them to make a choice about filtering. At this point, they can accept the current setting, change their protection levels or simply turn Sky Broadband Shield off,” says McGowan.

She adds, “Once Sky Broadband Shield is active, users cannot access a filtered site unless they choose to log in and alter their settings. However, they can browse away from the filtering page to visit freely any site suitable for the 13 age rating, without any interruptions.” She promised that Sky Broadband Shield wouldn't give the company access

Lowdown: Virgin Broadband

Virgin Broadband has no intention of following Sky Broadband with a default family-friendly filter. Instead, Virgin Broadband blocks access to websites found illegal in the UK – for example sites with child abuse imagery, as determined by the Internet Watch Foundation or The Pirate Bay. Beyond that, it supplies free parental controls, which families can choose to use to block various categories such as adult content.

A spokesman tells us, “We believe people should have the tools and advice to make the decisions that are right for them. This is why we invested in our highly acclaimed Switched On Families guide and all our customers have been offered free parental controls, but it is their choice as to whether to use them.”



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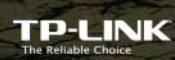


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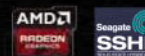


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How to set up and manage Sky Broadband Shield

Find out more in our simple
step-by-step video.

to the online activity details of its 5.3 million users "so your privacy will be protected". It is, she adds, about personal circumstances.

In practice, the filter broadly works well. It blocks pornography and other websites deemed unsuitable for children, and it can be adapted to operate differently at certain times of the day. Those in favour view it as useful, and those who are less than tech-savvy are able to gain automatic protection for their children. Indeed, when you take into account that a total of 14% of all web searches are for pornography and that a sizeable number will most certainly be made by curious children, it does, on the face of it, appear to be a shrewd move. It's certainly one backed by child protection charities.

"Sky's decision to automatically block broadband internet access to content that is only suitable for adults is a welcome step forward in protecting children," says Claire Lilley, NSPCC head of child safety online. "This move isn't about censorship. Anyone who wants to view adult content will still be able to do so by removing the filters. Leaving it to parents to activate content filters runs the risk that they may forget to switch them on."

And yet the filters are suffering teething problems, even now months and months down the line. In the case of Sky Broadband Shield, it has been found to automatically block file-sharing websites, and that has meant legitimate services such as news site TorrentFreak have also been restricted. In its favour, Sky has been quickly reacting to the issue – torrentfreak.com was soon unblocked – but some site owners have nevertheless been angrily hitting out at the catch-all default. They also say the company does not inform them that their services are to be barred.

Accidental Blocking

Perhaps more concerning is that the filters are blocking sites related to drugs, sex, alcohol, tobacco and anorexia that have been set up

Lowdown: EE Broadband

EE offers its fixed line broadband customers Norton Family software, which it says helps customers to make an active choice about the parental controls and filters that best suit their households needs. New customers have to make an unavoidable choice when they set up their broadband. No options are pre-ticked, but the customer must make a choice of 'yes' or 'no' as to whether they want to apply the software.

Existing customers are reminded by email about the availability of Norton Family from EE's website. The software can be applied across multiple devices, including smartphones, so it works in and out of the home, even if it's on another broadband or WiFi connection. Mobile broadband blocks content deemed suitable for over-18s by default and customers need to call to unblock.

The screenshot shows the EE website's 'Parental Controls with EE Home Broadband' page. The page has a teal header with 'EE & ME', 'SHOP', and 'HELP' links. Below the header, there's a breadcrumb trail: 'Help > Security > Parental Controls with EE Home Broadband'. The main content area is titled 'PARENTAL CONTROLS WITH EE HOME BROADBAND' and includes text about Norton Family software. There are sections for 'New customers' and 'Existing customers'. On the right side, there's a 'Related Articles' section with links to 'How to get Norton Family', 'How to get Norton 360', and 'Bright Box router - nearly there page'. A 'Show more' link is at the bottom right of the related articles section.

to help children suffering with various problems. Alcohol Support is just one of the sites identified as having been unfairly blocked. "We created a tool to help check whether websites are blocked by filters," says Pam Cowburn, communications director of the Open Rights Group, about **blocked.org.uk**, a site sponsored by a company called Andrews & Arnold, which provides unfiltered internet connections.

"It has shown that many websites are incorrectly blocked, including sites run by animal charities, political bloggers, churches and even the Girl Guides. Filters have also been shown to block websites that provide support and information about health, sexual orientation, drugs and alcohol that are specifically for young people. Often people running websites have no idea that their site has been blocked."

Its most recent stats show that 20,612 sites were blocked by strict filters and 10,849 by default filters. Sky Broadband's default filter is blocking 7% of the websites tested, while TalkTalk Kidsafe is blocking 6%. Applying TalkTalk's strict filtering appears to be the most effective, barring 13% of sites. The Blocked website says there is little or no transparency on the processes involved across the board and that it isn't clear how judgements are made.

"It's censorship by default," Cowburn tells Micro Mart. In her

“ Many websites are incorrectly blocked, including sites run by animal charities ”

organisation's view many households will not have under-18s living in them "so there is absolutely no reason for them to have parental controls switched on." She feels switching filters on by default does not give customers a choice.

"ORG believes that the best way for parents to keep their children safe is to talk to them about their web use and help them to develop the skills they need to navigate the web safely," she adds. "If parents decide to switch on filters, then that is their choice, but it should be an informed choice that takes into account the potential censorship caused by filters."

"Parents shouldn't be guilt-tripped into switching filters on, nor should they be lulled into a false sense of security – simply switching on a filter will not guarantee that your child won't see inappropriate websites. Given that households may have children of different ages, it may be more effective to switch on device-level filters depending on who is likely to use them."

But is it censorship? Even if it is not at this moment in time, there are some voices who warn that default filtering is only the start. In fact, The Guardian reported that the Metropolitan police had drawn up a list of terror-related websites that it wanted ISPs to bar, whether or not filters are in place or not. And the ISPs have co-operated, with a BT spokesman telling The Guardian in November last year, "We have had productive dialogue with government about addressing the issue of extremist content online and we are working through the technical details."

This would be less about the safety of children and more about removing such content from the eyes of adults, which is why critics are saying this kind of request extends the reach of the blocking software well beyond the promised remit. Others believe that the family-friendly filters are only doing a part-job anyway, lulling parents into a false sense of security by giving them a belief that the ISP can take away the need to worry about what children are accessing

Lowdown: BT Broadband

BT Broadband asks all of its customers to decide whether or not they want BT Parental Controls, its own set of filtering tools. It has three levels – strict, moderate and light – and it does not require software. An 'always allow' as well as an 'always block' feature exists. Sites concerning pornography, obscene and tasteless material, hate and self-harm, drugs, alcohol and tobacco, dating and nudity are among those filtered out.

A BT spokesman told us, "We launched BT Parental Controls in December 2013 and began contacting customers in early 2014 requiring them to make a choice as to whether or not they wanted to turn on our free controls – optional filters which block internet material deemed unsuitable for children."

"By January 31 this year we will have contacted 100% of our existing customers. Our customer choice question requires customers to make a choice about whether or not they want to activate parental controls. Customers who choose to do so are taken through a quick activation process in which they can personalise settings to suit their family's needs."

"BT takes the issue of online safety extremely seriously. Parents who would like more information about parental controls or how they can keep their children safe online should visit internetmatters.org."

Lowdown: TalkTalk Broadband

TalkTalk introduced a filtering system called HomeSafe in 2011. The following year, it gave all new customers an unavoidable choice: to opt in or to opt out of a filter. The idea, according to Alex Birtles, TalkTalk's head of external communications, was to allow customers to decide the level of protection they wanted. "Asking them to make a choice prompts them to think about the issue and consider their family's needs," she says, adding that two-thirds said they would not have activated controls if TalkTalk had not asked them.

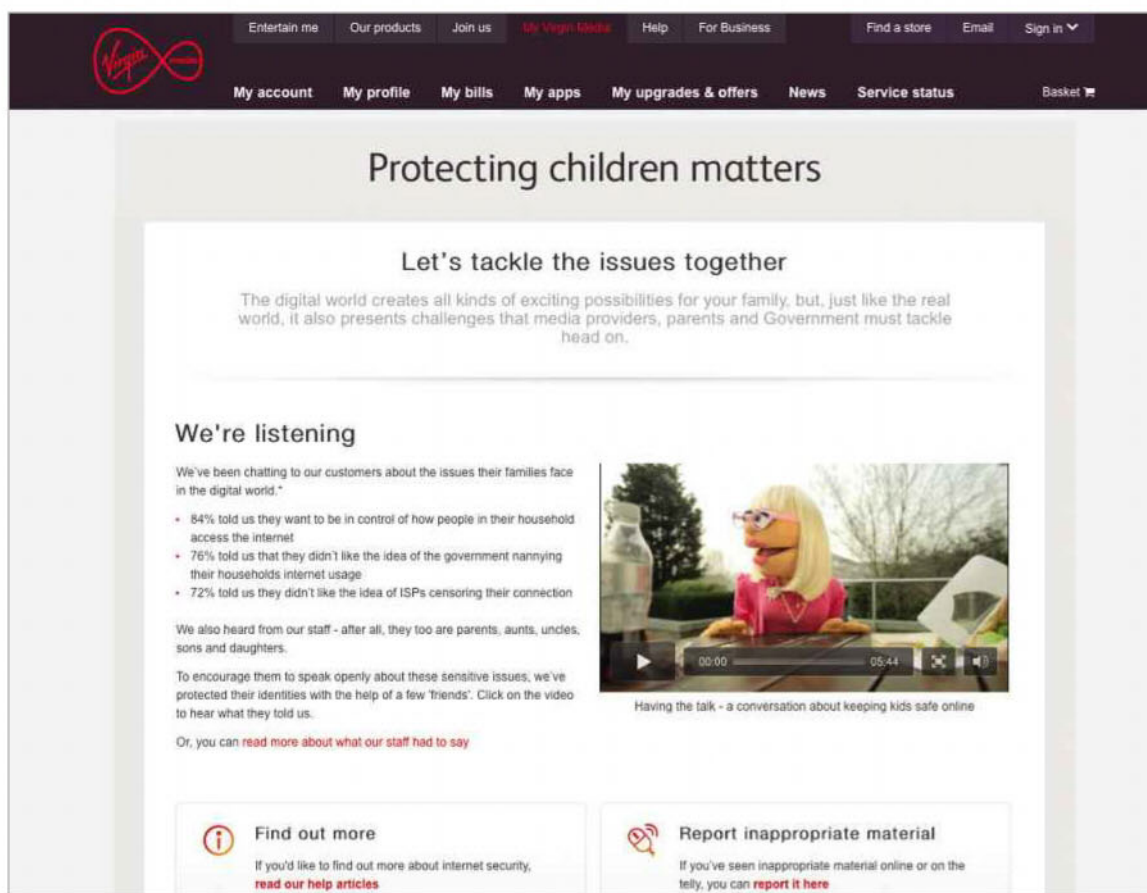
Last year, TalkTalk began asking existing customers if they wanted to opt in or out of HomeSafe. It directed people to their account settings where there was, again, an unavoidable choice. TalkTalk pre-ticked the 'on' button but allowed customers to turn it off. Since then, TalkTalk tells us, 95% of customers have made their decision. The other 5% have been presented with pop-ups when they visit websites that would be filtered by HomeSafe.

They are asked if they wish to decide to opt into HomeSafe, thereby blocking them from viewing that site or opting out and continuing on their way. Sites deemed unsuitable for under-18s include dating, drugs, alcohol, tobacco, gambling, pornography, suicide and self-harm, weapons and violence. It also can also filter out file sharing, game and social network sites.

online.

No Fix

"Blocking access to porn is not going to fix the problem," Ed Macnair, the CEO of web-filtering company CensorNet, tells us. "It's crucial that parents remain aware that other threats for their children still exist online. With an increased number of children accessing social media,



“ Users cannot access a filtered site unless they choose to log in and alter their settings ”

they still face the risk of grooming or inappropriate conversations. Kids could still also have indecent images emailed to them.”

He says parents need to take responsibility for what they are allowing their children to access, as well as ensuring specialist web filtering tools are installed on all devices – not just the home PC. But he also warns that ISP web-filtering by default is “too blunt an instrument”. He believes simply putting restrictions in place that block access to well-known pornography sites doesn’t take into account the way the web works, nor how some young web users are able to manipulate it.

“Hundreds of similar websites containing indecent content launch every day, and no doubt some will slip through Sky’s controls,” he explains. “But with a little know-how, anyone that is determined can take advantage of proxy servers or encryption technology to access restricted sites.” While he applauds Sky for what he says is positive action to protect children from accessing inappropriate content online, he adds, “Internet service providers need to take much more responsibility for educating parents and children about the real risks.”

Lilley agrees with this sentiment. The NSPCC has produced a Share Aware guide to help parents understand the sites and apps their children might be using and start having these important

conversations. “Protecting children from inappropriate content isn’t just about the filters on your broadband connection but also on the devices you or your children use,” she says. “And individual websites and apps will have their own safety and privacy settings. No filter is 100% accurate, however, so parents should talk to their children regularly, in a non-judgmental fashion, about their online lives.”

The issue of censorship, though, is one that is set to rumble on for a long time to come. [mm](#)

What About Images Of Child Abuse?

Illegal images of child abuse are being dealt with separately by the Internet Watch Foundation. It alerts ISPs about such material so they can, quite rightly, block the content regardless of any filters. Images that are reported are immediately added to a list, and the pages that hold them are blocked by search engines and ISPs so that they cannot be accessed.

Warning pages are put in their place, giving a clear indication of what the page contained. They warn those who land on such sites of the consequences of seeking images of child abuse, and they are directed to the charity Stop It Now!, which seeks to alter the behaviour of those who look for this kind of content.

At the same time, steps are also being taken to infiltrate the ‘hidden internet’ – the illegal files being shared on sites or networks carefully positioned away from the mainstream. The UK is working with international law enforcement agencies to help ensure that this issue is tackled as widely as possible.

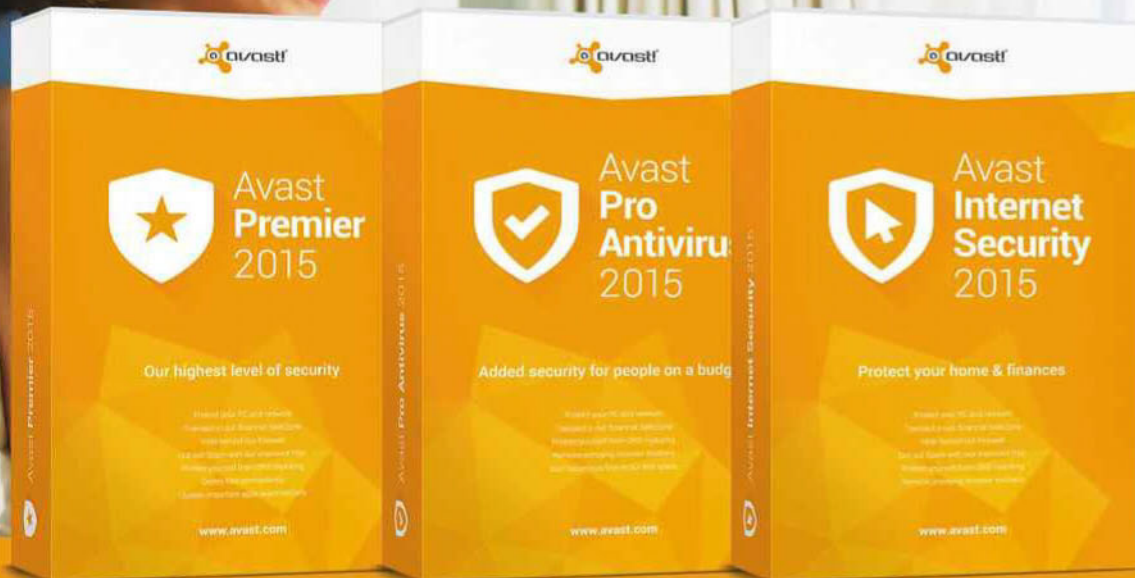
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It's also a good psychological boundary, being a fair amount of money, but also an affordable amount. It's a meal out, a full tank of petrol or a DVD box set. If you can treat yourself to one of those once in a while, you should be more than happy to spend the same on something useful. So, what sort of things can you buy with that sort of budget? We've looked into it, and this is what we found.

Input Peripherals

When you can buy a mouse or a keyboard for a tenner, it takes a lot of effort to spend as much as five times that on an input device that does basically the same job. Look at it this way, though: this is hardware you'll be using almost every day, probably for hours at a time. Spending more money means better quality components, longer-lasting hardware and – perhaps most importantly – better health features that'll save you from strain and injury.

Mouse: Microsoft Sculpt Comfort Mouse (£27)

Picking a new mouse is hard to do if you aren't able to hold it in your hands, but if you have no idea where to start then Microsoft's reputation for high-quality input devices makes them the ones to go with. There are lots of radical designs up near the £50 mark, such as the Touch Mouse and the Wedge, but of the available options we kept returning to the Microsoft Sculpt Comfort Mouse, which is a recent design intended to work perfectly with Windows 8 (but don't let that put you off).

The blue Windows tab takes you straight to the start screen as well as allowing you to navigate webpages using a series of swipes and taps, while the tilt-wheel offers four-way scrolling. Bluetooth connectivity lets it work with a range of devices on almost any operating system, including iOS and Android. It's light, precise, and well within budget. We admit that it's not particularly flashy, but as mice go it feels fresh, responsive and fantastically comfortable. As long as you're not left handed.

The only complaint we have is that it's three-button (rather than five). This means that if you don't get on with the swipe-to-navigate interface it's not going to endear itself – but at this price, we think it's worth taking the chance.

Gaming Mouse: Cyborg R.A.T. 5 Gaming Mouse (£47)

If you're a hardcore gamer, the thought of using a basic mouse probably fills you with some kind of disgust – and if you're new to the field, then be warned that a £50 gaming mouse only puts you comfortably in the middle of the pack.

The Cyborg R.A.T. 5 is dazzlingly precise, though, with a DPI range of 100 to 5600 adjustable in 25dpi steps. A rocker on the mouse body allows you to quickly change between four pre-defined sensitivities, and its 1000Hz polling rate ensures even the slightest movement can be captured. It can theoretically track up to six metres a second – well beyond anything you'd need.

The customisation options are also well beyond the level its price suggests they should be. The body of the mouse is adjustable so that it can fit to your hand's size and shape and even your preferred grip. You can change how light or heavy it is thanks to a removable weight system (allowing you a range of 30 grams) that can be easily swapped in and out. It has six programmable buttons in addition to the regular left and right

buttons. It's even got a braided USB cable. As gaming mice go, it's an ideal 'entry-level' piece of hardware.

Keyboard: Microsoft Sculpt Comfort Keyboard (£28)

What better companion could there be for the Sculpt Mouse than the Sculpt Keyboard? None, really. Once again, Microsoft proves that it knows what it's doing when it comes to office-quality peripherals, and at £28, it's also well inside the £50 budget we've set.

The Sculpt Keyboard uses a wireless radio connection, so it's not much use on tablets and phones, but it's great for setting up a wireless desktop on your home computer. Constructed around ergonomic design principles with a detachable, cushioned wrist rest and a split space bar that incorporates a backspace function, you'll soon get to grips with the design. Although there's a slight curve to the shape, it's basically the same as any standard keyboard – just with high-quality materials and engineering that make it fantastic to type on. The control shortcuts printed on the front of the keys are also a nice feature for novice users.

The only down side we can offer up here is that, for some odd reason, it doesn't have LEDs for Caps Lock/Num Lock, etc. While you might not miss a Scroll Lock light, we can imagine the lack of a caps indicator might lead to the occasional frustrated password attempt. Ultimately, though, the good outweighs the bad enough for us to recommend it.

Gaming Keyboard: SteelSeries Apex RAW (£30)

The best gaming keyboards hover around the £80 price, so finding a cheap one can be difficult – but that doesn't mean you can't get a reasonable piece of hardware for less. A case in point, the SteelSeries Apex RAW started its life at a price well above £50 – though that's dropped as it has aged, despite it still being a great piece of hardware in a practical sense. Note, however, that it's hard to find from specialist retailers (who largely stock newer designs). It's still widely available from high-street retailers, though, so worth looking out for.





The keyboard features fully customisable keys capable of detecting two simultaneous keypresses and anti-ghosting for up to 20. There are 17 macro keys with two macro layers, a tactile bump on the W to make it easy to find without having to look, and a white backlight with eight levels of brightness. The keys are low-profile for faster activations and you can tilt it to several different angles. Although it's not mechanical, that's not a feature you'll find in many, if any sub-£50 keyboards. This has

“ The only reason we can think you might reject this joypad is if you prefer a PlayStation-style layout ”

all the features of a higher-priced keyboard, just not the fancy key mechanisms, so it's still a huge step up from using generic membrane keyboards. If it wasn't for the lack of microswitch clicks as you typed, you might not even notice.

Game Controller: Microsoft Xbox One Wired PC Controller (£40)

No PC gaming purist would be caught dead with a game controller at their desktop system, but the more moderate among you will probably enjoy the chance to play games the same way you do on your console: comfortably. Unfortunately for those hoping to discover a hidden gem, the truth is that Microsoft already nailed down the video game controller with the Xbox 360's incarnation, and this slightly modified Xbox One version is just as good, if not slightly better. You have to spend another £20 to get the wireless version, which places it out of our budget's reach, but let's face it – it's not too difficult to live with a wired controller when you're playing games while sitting in front of a desktop system, and at least you don't have to worry about batteries.

Hardware-wise, it's got the lot: an analogue D-pad, redesigned thumbsticks with better grip, more ergonomic contours, 11 digital buttons and two analogue triggers. The only reason we can think you might reject this joypad is if you prefer a PlayStation-style layout. The one thing it's arguably missing is a set of programmable macro buttons but, in all fairness, that's not enough to put us off. The quality of this controller is just too high in every other area.

Storage Hardware

No matter how much storage your system has, it always feels like you could do with a little more. Perhaps you want your system to be faster. Perhaps you want a more convenient way of transferring large films. Or perhaps you have a lot of Blu-rays that you never get around to watching because you can't stick them on your laptop in bed. Whatever your reasoning for wanting improved storage is, £50 is enough to get you a lot of great deals. Deals such as the ones we've picked out:

Internal Hard Drive: Western Digital 1TB Blue (£43)

There are loads of hard drives under £50, so finding the right model can be a challenge. With mechanical drives it makes sense to aim for a high capacity, rather than a high-performance drive, since that's what they're good at – and we reckon the Western Digital 1TB Blue fits the bill. In contrast to other Western Digital models, Blue-rated drives are configured for day-to-day use which gives them better all-round performance – though if you're buying a second drive for storage purposes then a Western Digital Green drive might be a better choice, since they're optimised for long-term storage.

What makes Western Digital's pricing so attractive, though, is that it includes a replacement plan. In addition to a two year warranty, you get a year of Western Digital Care Express,





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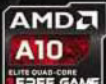


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which gives one a one-business day RMA replacement in the event of a drive failure and an extra year of warranty as long you register the free coverage within two years – so that's three year's coverage for free. Western Digital drives have reliability and price economy on their side too – the failure rate is lower than Seagate hardware and the price is cheaper than the more-reliable Hitachi drives, making them a perfect compromise – and ultimately, the care plan swings it in favour of Western Digital.

Solid State Drive: Crucial BX100 120GB (£49.98)

Although SSD pricing is coming down, £50 is still quite a low limit on what you can expect to buy, and that means any sub-£50 SSD is going to be, at most, 128GB in size. Of those available, the Crucial BX100 is top of its class, and scrapes in under the £50 bar by two whole pence.

With a maximum read speed of 535MB/s and a maximum write speed of 450MB/s, it's not the fastest SSD on the market, but it's also comfortably beyond anything a mechanical drive can manage. Inside you'll find an ultra-reliable Silicon Motion SM2246EN controller, with Crucial's own firmware, which gives it the edge of other similar hardware.

Inside the 520 series drives you'll find the latest 16nm MLC NAND flash, which comes with 256-bit AES encryption – some of the best security available. There's a limited warranty of three years, but you're unlikely to need it as Crucial's hardware offers a MTBF of 1,500,000 hours. Not only does it blow mechanical drives away in every area except capacity, it also puts up a fair fight against any similarly priced SSDs. We're not sure a 120GB SSD is the most useful route for everyone, but if you must have one this is the one to get.

Optical Drive: Asus SBC-06D2X (£50)

Shop around and you can find a few places selling the Asus SBC-06D2X for dead on £50, which is great because if you want to add a Blu-ray drive to your system, you don't really want to spend more than that. Many system builders are trying their level best to do away with optical drives entirely, but that doesn't mean you have to.



As well as access to the huge storage of recordable Blu-ray media and HD video, the Asus SBC-06D2X is easy to swap between systems thanks to its external interface, while the unique upright design ensures that it looks great and doesn't take up too much desk room. Obviously, it requires a compatible display to get the most out of HD content (at least 1920 x 1080), but if you don't have access to a Blu-ray drive then it's still worth buying instead of a normal player.

“ System builders are trying their level best to do away with optical drives entirely, but that doesn't mean you have to ”

Plus, you shouldn't have to worry about replacing it. Optical drives are virtually impossible to destroy under normal use and this is a top-quality example. One quirk is that it's powered by USB and requires two cables to run, but if you have an adaptor going spare you should be able to plug it into a conventional power source as well. In short, it was good enough for us to break the 'under £50' premise of this article; you'll forgive us for the sake of a penny, won't you?

External Hard Drive: Samsung M3 1TB (£49)

We've probably recommended this hard drive dozens of times by now, but until the price drops substantially enough to bring the 2TB version under £50, there's no sign of that stopping. Although the low pricing is what attracts us primarily to the Samsung M3, it's still a great basic storage unit with everything the casual user could want. Its USB 3.0 interface means super-fast transfer speeds and short file access times. Its 1TB capacity gives you enough storage for either active or archival use.

One of the best features is that it's powered entirely over USB, so there's no need to find a separate power socket to run it. This also makes it compatible with almost anything that has a USB port, from computers and laptops to games consoles, set top



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boxes and routers with network storage capabilities. In addition to that, it's lightweight but sturdy, which means it's perfect for portable or deskbound use. Because it's Samsung, it looks great and has fantastic reliability. No hard drive is ever 100% safe, but we have no reason to believe that this one will let you down.

Flash Drive: iStorage DataShur 4GB (£40)

£40 might sound like a lot of money for a 4GB flash drive, but it's no rip-off. There's something this one does like no other, and that's security. Flash drives are easy to lose track of, especially if you're working out and about, but the encryption on this one is so strong that you could drop it in the middle of MI5 and not have to worry about anyone getting access to it.

A unique combination of 256-bit encryption and hardware-based access code ensuring that no-one but you can get at your drive's contents. The unit's military-grade hardware encryption is effectively unbreakable: without the hardware code, the data is utterly meaningless even if decrypted.

There's no need for additional drivers or software, and it's compatible with virtually any operating system – just plug it in, enter the keycode, and your data becomes accessible as if on any normal USB key. Remove it from the USB port, and it locks instantly. You can even configure PIN codes with different rights levels, so 'users' are limited to read-only access, and full access is restricted to those with an admin-level code. It's also water-resistant and constructed from shock-proof aluminium casing designed to shield the unit from the elements. Expensive, yes, but more than worth it if security is your priority.

Gadgets And Accessories

A lot of serious hardware is placed out of reach by a £50 budget, but that doesn't mean you can't buy fun stuff instead. Let's face it, a new CPU or graphics card might improve your computer in the abstract sense, but as it's something that's hidden away under the case you're only really pleasing yourself. If you buy new speakers, a headset or a desktop gadget, at least it'll feel like a tangible improvement you can show off!



Media Streaming: Google Chromecast (£30)

Although it's most famously used for linking mobile devices up to a TV, Google's Chromecast can do the same for your desktop machine as well – and it's even easier than you may imagine. Chromecast uses your existing wi-fi connection to stream content from your desktop or laptop to your PC, including anything you can play in your browser.

In addition to that, it runs its own version of Android so you get access to all your favourite streaming media apps natively, like Spotify and Netflix, not to mention BBC iPlayer. You can use your smartphone or tablet as a remote control, and it supports multiple devices at once so there's no need to constantly pair and un-pair.

Admittedly, if you have a smart TV you might find that a lot of these features are already available, but for £30 the Chromecast takes away a lot of the configuration and compatibility issues you might experience while trying to use a traditional software DLNA server to stream content, and even then you don't get access to the screen mirroring feature. It's worth it for big-screen YouTube control alone, really. Cat videos never looked so good.





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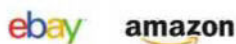
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TOSHIBA





Speakers: Logitech Z320 (£49.98)

Good speakers can change the way you look at your system by changing the way you listen to it. A £50 budget is more than enough to get you a convincingly powerful pair, though sub-woofers and satellite surround systems are largely out of the question. These Logitech's, however, come in (again) at 2p under our limit and will do sterling work.

The Z320 speakers are huge compared to the rest of the company's speaker line, but if you want full, loud, high-quality sound, you won't find better at this price. What makes the Z320s special compared to any other sub-£50 speakers is that they contain an additional sound driver (making a total of three per unit), which is mounted at the rear of the speaker to provide 360° audio and a much beefier sound in general.

The speakers are mains-powered and have a 20 watt total output, and aside from the third driver the feature set is fairly simple: a power/volume control on the front, headphone jack on one side, and both line-in and aux input at the back. They look great, sound great, and the price is just about right. You won't be able to do much with the change from £50, but when the audio's this convincing that's not going to bother you one bit.

Headset: Razer Kraken 7.1 (£50)

There was a time when the Razer Kraken 7.1 would've been too expensive for a £50 budget, but time marches on, and with it come the inevitable price drops of aging hardware. Not that the Kraken is any worse today than when it was first released. If anything, the price drop makes it a convincingly better buy. It's ideal for fans of gaming and movies because it offers a full surround sound experience, but in a pair of headphones. Loud on the inside, quiet on the outside.

As headsets go, it's super-comfortable and uniquely equipped with an advanced virtual surround sound engine that simulates 360° surround sound. There's an omnidirectional microphone

for voice chat, which is built into one earphone and can retract when not in use. It's that sort of thing that makes the Kraken particularly great. It's filled with neat touches, such as an LED on the mic that shows you at-a-glance whether it's active or not, and an extra-long 2m cable to ensure that you're not tethered too close to your desk or TV.

With its virtual 7.1 surround audio and powerful, clear 40mm headset drivers, the Kraken offers deep bass, superbly detailed audio output and (most crucially) ear-cups that remain comfortable even after long periods, it absolutely storms away with our recommendation for top headset. Most days, we'd rather have a pair of these than speakers!

Webcam: Logitech C525 Webcam (£45)

Webcams come in two forms: cheap and nasty, or expensive and amazing. Luckily for anyone with a budget of £50, you can get something pretty high-end for that amount of money. Whether

“ As webcams go, it's well above the standard of all except the most expensive hardware ”

you're planning to Skype with your family or video conference your colleagues, a £50 webcam is going to look as futuristically clear as your connection speed can technically allow.

You don't get a full HD camera for under £50, but the Logitech C525 is a great mid-range model capable of recording and streaming 720p video, and featuring an unusual fold-up design that makes it an ideal choice for sporadic use or partnering with portable systems. Logitech's hardware is always high standard, and this camera reviews better than most in the price range.

The software effects may be a little frivolous with its selection of filters, effects and cartoonish borders, but it's compatible with all major videoconferencing software and can be used to capture full-speed video, so it's perfect for vlogging. Facebook and YouTube integration make uploading and sharing videos as simple as you could like, and it can even capture HD stills up to 8MP. As webcams go, it's well above the standard of all except the most expensive hardware, and that makes it worth spending your money on. [mm](#)



Everything you'll ever need to know about **Windows 8**

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Your Letters

Unfair Play

I've been playing PC games since the days of the original *Doom*, and in that time, I've upgraded my computer and/or the components countless times. I don't have infinite supply of money, so I try to avoid it as much as possible, but eventually I find that the latest games just won't run, and then I realise it's time to bite the bullet and actually spend some cash.

Sadly, I got signs of this problem just this week. I thought I'd check out the new zombie game *Dying Light*, so I downloaded it on Steam. When I went to play it, though, it ran like a dog. And not

a greyhound, but a Bassett hound with a gammy leg. Okay, that's an exaggeration, but even on the lowest settings at 1080p, it would drop below 30 frames per second, which is painful even to my old and tired eyes.

Well, I thought, I guess the time has come to get a new graphics card, because the one I have has put in a good four years of service. But then I thought about it again. I looked at the graphics, and yes they look good, but they don't seem to be miles ahead of things *Crysis*. In fact, they might even be worse. So why does this game run so badly?

I concluded that it must be bad coding, plain and simple. The fact that the keyboard controls are all over the place suggests to me that it's just another bad console port. Why, then, should I bother to upgrade, just because developers can't be bothered to optimise their games? Not only can I save money by not buying new components, I can avoid paid forty quid for one of these so-called AAA games. There are plenty of independent games that can run even on integrated graphics, and they're nearly all better in terms of gameplay.

Lee Hurley

Windows 10

Your article on Windows 10 this week shows just how quickly things can change in computing, I suppose; apparently reports of Microsoft's demise have been greatly exaggerated, which I found very interesting.

If the tide is turning, and a company that seemed to be in the shadow of Apple and Google for the past few years has suddenly managed to seem make itself seem cutting-edge again, one has to wonder if it's not just because of the complete lack of innovation from its competitors. One that just relies on overpriced hardware, while the other just seeks to undercut its competitors with free software based on 'me too' concepts (Doc = Office, Android = iOS etc) with the aim of gathering ever more detailed data about us.

What I really wonder, though, is how it came to be that the workaday Microsoft is now the one making the 'bold', 'innovative' tech moves (if you believe the hype) while the outliers of the Linux world seem to be locked into a copycat mindset that would make Google blush (or at least unable to produce anything that makes the vast majority sit up and pay attention)? You'd think that having no bottom line to worry about would bubble up some brave ideas, attract some mavericks, maybe throw out a cliché or two, but that doesn't seem to be the case. It would seem that big money corps need to be pushed to the brink before they start taking real chances like that Hololens doo-dad, and that's a shame. Then again, maybe the whole Microsoft revival will turn out to be wishful spinning.

Martin Prince

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Component Watch

The £100 barrier can be a tough one to break, so here are a few deals that can make you feel like a big spender without actually having to be one...

New hardware is expensive, most of us accept that – but if you’re looking to upgrade, you can probably get more mileage-per-pound by buying old hardware that’s dropped in price. That’s why, in this week’s component watch, we’ve gathered together a collection of products you can buy that used to cost more than £100 – but no longer do thanks to discounts, offers and price drops. It’s still a lot of money, but somehow, when it comes in under than three figures, it seems like a lot less!

Deal 1: Speedo Aquabeat 2 **RRP: £105 / Deal Price: £52**

Whether you’re a dedicated swimmer who looks jealously at runners working out to their favourite tunes, or just someone who thinks they’ve seen every MP3 player variation out there, then this one’s for you: a 4GB MP3 player you can use underwater! With 25 hours of playtime and special ear-sealing headphones, this is one MP3 player that’ll make swimming even more fun, and could well be the ultimate holiday accessory for the more active among you. It’s waterproof at up to three metres, and now available at more than half off retail – so it’s a great time to take the plunge!

Where to get it: Speedo (bit.ly/1qq0b85)



Deal 2: Cooler Master Silent Pro M2 620W PSU **RRP: £110 / Deal Price: £65**

When it comes to PSUs, Cooler Master is a name you can trust – so at close to 50% off its full price, the company’s 620W Silent Pro M2 is a fantastic deal by anyone’s standards. With excellent thermal performance and electrical efficiency, this is a power supply that won’t waste your electricity (and thus your money) and its silent running capabilities mean it’ll remain discreet even at full load. The modular and low-noise features make it a perfect choice for home theatre PC enthusiasts, who need a powerful but nigh-on silent system, but it’ll work just as well in any system. Scan have got the deal, and it’s a corker.

Where to get it: Scan (bit.ly/1y15J6W)



Deal 3: Asus RT-N56U **RRP: £103 / Deal Price: £65**

If you want a speedy new router, the Asus RT-N56U is as fast as it is good looking. Not only does it throw off the shackles of traditional router design, it discreetly houses multiple aerials which are embedded in the device’s fascia: two for 2.4GHz, and three for 5GHz, giving you full Wireless N600 compatibility. There are also four Gigabit LAN ports and even a USB port, which allows you to share storage and printers across your network. A fantastic router, at a great price.

Where to get it: Transparent (bit.ly/1JGRWtY)



Deal 4: Dell C1760NW Wireless Colour Laser Printer **RRP: £125 / Deal Price: £95**

It’s as cheap as colour laser printers get, but that doesn’t mean it’s particularly cheap. Even so, the Dell C1760NW is a good investment if you need to do lots of high-quality colour printing. It’s not the fastest printer at 15ppm, but its 150-sheet tray feed and network, USB and wi-fi capabilities mean it’s convenient to use and shouldn’t demand too much of you. Just watch out for those toner prices!

Where to get it: Ebuyer (bit.ly/1ymBhp1)



Deal 5: Intel Core i3-4330 **RRP: £116 / Deal Price: £80**

It’s getting on a little, but this still competitively-new Haswell CPU is a dual-core Intel Core i3 clocked at 3.5GHz – perfect for light-to-medium use, whether in the household or in the office. It’s not the fastest Haswell chip around, but it is one of the fastest you can get without shelling out more than £30 more for a Core i5 chip. Certainly a bargain worth taking advantage of.

Where to get it: NewEgg UK (bit.ly/1Cg5zzb)



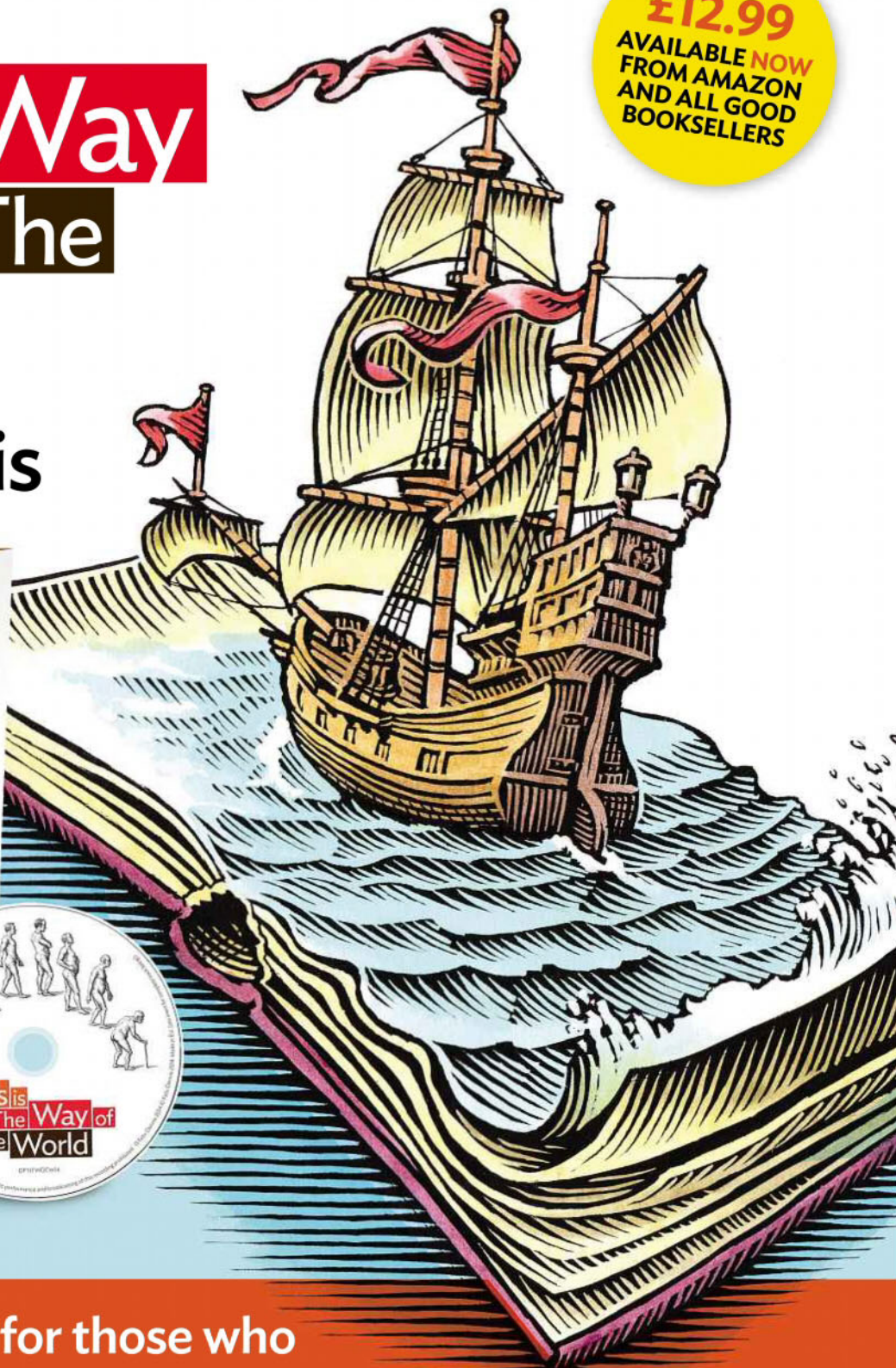
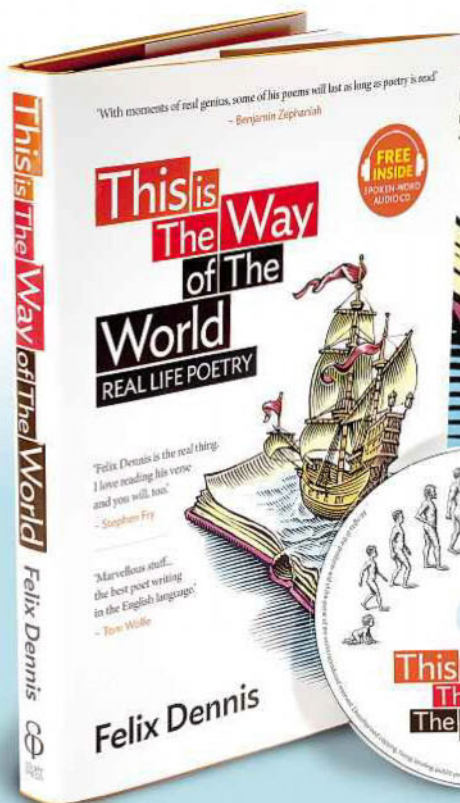
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Strings Lets You Take It All Back

Delete messages sent in error

Windows 10 Brings Cortana To Desktops

Free upgrade for existing Windows users

We've been waiting for this one. Microsoft has officially unveiled further details surrounding its Windows 10 OS, and it turns out that if you're a current Windows 8, Windows 7 or Windows Phone user, you can upgrade to the latest OS for free – for the first year of its release, in any case.

As for the headline features of Windows OS, its Cortana voice-activated assistant is right up there, as is its Spartan browser, plus of course the HoloLens headset. HoloLens is, according to Satya Nadella, a “magical moment” but – aside from the fluffy language – the reality is that these particular see-through lenses are shaping up to be something pretty special. At least on paper.

Microsoft's demo suggested it is technology that could render computer-generated imagery around the user (actually using augmented reality to achieve this). Think *Minority Report*, only with less frantic police activity. Nasa, no less, is working with the headset and consumers should see it available to them within Windows 10's “timeframe”.

More broadly on Windows 10, will Windows Phone users truly be upgraded this time around, given the problems with upgrading Windows Phone 7 handsets to Windows Phone 8?

Well, Microsoft is claiming this is the case but in reports pointing to its Lumia Conversations blog, a post noted “not every phone will upgrade or support all possible Windows 10 features.”



Social media is such a mental minefield that we wouldn't be at all surprised if plenty of you reading this had sent out a message at some point that you wish you could take back.

US app developer Strings has come up with the solution, an instant messaging app that lets you "share what you want with who you want and take it back, if you want". Yes, this app can let you delete sent messages, images and videos from both your phone and from

the phone of the recipient, stopping said recipient from downloading, sharing or taking a screenshot of the message content without your say-so.

The only problem with this app, and it's a biggie, is that the recipient also needs to use the Strings app as well as you. So, while it does offer control over the content, it's only effective providing that everyone you message uses the same technology. If this takes off, then, great. If not... then not so useful.



As a parent, the subject of internet filters is one that affects me directly. Naturally, I want to protect my offspring from the darker corners of the web, as any right-minded adult would, but do I use ISP-level filtering on my broadband? No, I don't.

Why? Well, for a start, I don't allow my daughter to use the internet unsupervised. She's of infant school age, so that seems like common sense to me. If she does go online to access CBBC or the school's online reading log, she does so on an iPad, for which I can simply download local parental controls if I think I need to.

Right now, though, it's simply not necessary. Will I need to rethink this when she's a bit older? Yes, it's quite likely I will, but I'll also be making sure I educate my daughter about the dangers of the web, rather than simply relying on an imperfect blocking system that may be as problematic as it is useful.

Hopefully, the majority of parents will do the same, whether they opt in or out of the new measures.

Anthony

Editor

Three Seeks Plus One With O2

Multi-billion deal could come under scrutiny

In a merger bid that could raise serious eyebrows among industry regulators, mobile provider Three has put its cards on the table by showing significant interest in buying out fellow provider O2. Three's parent company Hutchison Whampoa has confirmed a bid of over \$10bn for O2, following on from BT's bid for EE at the back end of last year.

The negotiations with Telefonica, the parent company of O2 UK, should be ongoing as you read this and – while it no doubt makes good sense for Three – we're doubtful whether this is really great news for mobile customers in the UK. Competition is all important in keeping down our bills so, with fewer providers on the cards, we wouldn't be at all surprised if regulators such as Ofcom had something to say on this matter.

However, for Hutchison Whampoa's chairman, Li Ka-shing, this could be another deal that adds to his already bulging coffers – he's Asia's richest man, don't you know.



▲ *Could a busy mobile market be about to get slightly, erm, less busy with this deal?*

Meanwhile... On The Internet...

Without getting too philosophical here, it's pretty obvious to us that we live in adversarial times: lots of things nowadays are described as 'wars', that's for sure. However, they're usually amorphous concepts: the war on drugs, the war on terror, the browser wars – you get the idea. What these phrases are shorthand for are clashes of belief or paradigms (tinyurl.com/Motl1348a). It's basically one idea pitted against another; no one wins these battles, and they are destined to go on forever because, well, beliefs are beliefs, desires are desires. And people are belligerent, stubborn and vocal when they believe their view of the world or what they want is being oppressed or denied to them.

Which – sigh – brings us once again to #Gamergate, a hashtag that, rather than being a short-lived meme on Twitter, is actually a label that defines pretty much diametrically opposite views of a situation held by (on one side) a relatively small group of male gaming enthusiasts and (on the other) pretty much everyone else. Certainly, we'd reckon, all the people who assumed that years and years of academic debate had pretty much cemented the ideas underpinning feminism (if not, perhaps, some of its chosen solutions) as relevant and identifiable in the real world, anyway (Hermione knows it, that's for sure: tinyurl.com/Motl1348b).

"But," we hear you cry, "#Gamergate's so 2014; we've all moved on now, right?" Well... no, and this is the point. We'll never move on from #Gamergate – or, at least, we never should. It's a cause célèbre that will, as it rightly should, inform debate on the matters on which it touches pretty much forever, because #Gamergate was an issue in 2012, 2002, 1992, whatever – we just didn't have that truly awful label to stick on it.

It's right to have a debate about journalistic ethics and the fine line we walk when we are part of a community that we also have to comment critically on. The point where we draw that fine line is of the utmost importance. It's right that people like Anita Sarkeesian critique the ideas videogaming perpetuates and that programmers like Zoe Quinn seek out new frameworks and subject matter for games that go beyond the tropes. All this is good.

What isn't acceptable are the persistent threats of violence that one side of the argument continues to aim at the other.

You should perhaps ask Sarkeesian (tinyurl.com/Motl1348c) and Quinn (tinyurl.com/Motl1348d) whether they think #Gamergate is over. Judging by the articles that have appeared concerning them over the last week or so, the simple answer is 'no'. 'Hell no', probably...

It would seem that, as happens with amorphous wars, we've long lost touch with the idea that there are real people on both sides of fence. That's easy to do when there's such an imbalance in the rhetoric, though. While Sarkeesian is as erudite and knowledgeable as you would expect a well-travelled academic to be, those wishing to debunk her and call into question the motivations of both her and the media they believe is supporting her appear to be happy to hide behind throwaway Twitter accounts – and the ones that don't, don't exactly cover themselves in glory (tinyurl.com/Motl1348e).

Of course, we've been here before: the role of the troll in internet culture has been debated very hotly by the likes of us over the last few years – and we've long mourned the evolution of the term from one that carried with it an air of anarchistic fun (tinyurl.com/Motl1348f) to something much more insidious. What's really frightening, though, is that trolls are people too, as blogger Leo Traynor found out (tinyurl.com/Motl1348g).

While we seem to be on the theme of things that just simply won't go away, news broke that The Pirate Bay – or at least the latest group of people who have taken up its flag – will be returning in the very near future. In fact, by the time you read this it should be happening already (tinyurl.com/Motl1348h). Yes, the countdown that sits above the new Phoenix logo at the site (**URL THAT SHALL NOT BE NAMED**) seems to imply that February 1st would be the big day when the new-look go-to torrent site would be revealed... Time will tell, but we bet it's a bit like the old one.



It's been leak central in the music industry of late: Bob Dylan, Björk and Madonna have all seen their latest works appear online before they – or more specifically their record labels and PR teams – would have wanted them to. The leak of songs from Madonna's *Rebel Heart* undoubtedly proved to be the most high profile of these unauthorised releases, though – a situation which led her to rush-release the LP in the hope of stemming any potential for lost sales.

The *Rebel Heart* leak, though, has now come with an interesting twist in the tail, with the news that Israeli police have arrested 39-year-old Adi Lederman on suspicion of hacking computers belonging to the singer and releasing the files (tinyurl.com/Motl1348i).

Of course, Oscar season is usually also boom-time for film piracy too. This year may be a little different, though: apparently those handy Oscar screeners just aren't up to snuff anymore... Who knew (tinyurl.com/Motl1348j)?

.AVWhy? Videos For Your Eyes... Not Necessarily For Your Brain

Well, of all the times we've ever chosen a video for this little corner of the magazine, this is probably the easiest decision we've ever had to make. Ladies

and Gentleman we give you the POTUS performing *Uptown Funk*... Don't believe me? Just watch: tinyurl.com/Motl1348k.



Caption Competition



It's caption time again, so let's see what you made of the curious chap:

Doctoryorkie: "Health & Safety has gone down the pan – joy brought to millions."

The Duke: "Pot-holing London style is not a patch on Cumbria!"

Think Tank: "Who works for number 2? Dan does."

tis me JB: "Hhhheeeellllpppp my leg's stuck down the waste pipe."

phantom9: "Dave didn't quite grasp the concept of Game of Thrones."

phantom9: "All I said was 'I don't like your choice of colour for the tiles!'"

Biddy: "A new twist to the old story of the cannibal who passed his brother in the jungle."

EDP: "Someone told me that Nigel was round the bend!"

~Wiz~: "He's a fibre engineer."

nadine.wood: "Can I have that magazine when you're done with it?"

Blacklion1725: "Australian plumber realises he got carried away."

Isdaritden: "Bogged down at work again"

Dwynnehugh: "Me thinks the installation of Crap Cleaner went badly wrong somehow."

wyliecoyoteuk: "Just goes to show, you never know where a portal will open..."

Gary Mann: "I think they've been eating too much fibre!"

Thomas Turnbull: "Feeling flushed – got a free copy of Windows 10 but told to keep a lid on it."

Thanks for all your entries, but the winner was D-Dan from the forum, with "I said *don't* flush the cache!"

To enter this week, head to the 'Other Stuff' section of our forum (forum.micromart.co.uk) and say something funny (but not too rude) about the picture below or email us via caption@micromart.co.uk.



Tim Cook's In The Money

Salary rises by over 40%

Tim Cook is right to have a smile on his face, as Apple's annual report has revealed that his base salary rose from \$1.4m to \$2m over the last year, while his total remuneration more than doubling to \$9.2m during 2014.

The company's other executives had tasty pay rises too, which isn't surprising given Apple's record share price and the vast number of iPhones that are still being sold year on year. It's also interesting to note that this is the first salary increase for Tim Cook since November 2011.

These are happy financial times at Apple – Indeed, according to some reports, if you take into account his stock investments, means Cook's actually pulled in over \$100m during 2014!



Full Office 2016 Suite Due This Year

Release alongside universal office apps

The other big news from Microsoft was that there will be a full Office 2016 suite release this year, optimised for use with new Windows 10 desktop systems.

This fully-functional suite will co-exist with a bunch of universal Office apps that will run across all Microsoft devices – desktops, laptops, tablets and smartphones. Pre-installed on phones and tablets running Windows 10, these apps will also be

downloaded from the Windows Store. The thinking is that these apps will feature restricted functionality, like the existing mobile apps that also need a subscription to Office 365 for document creation and editing.

In whatever form it takes, expect this to appear some time in the second half of the year.



Snippets!

Samsung To Make Chips For iPhone?

An interesting report has come out of South Korea, where a business newspaper has cited sources in the semiconductor industry as stating that Samsung is going to be the main supplier of processors behind the next iPhone. The newspaper went on to write that the tech giant will be responsible for around three quarters of processor production, although it has no details on how much the contract is going to be worth.

Twitter Instagram Plea

Twitter has posted out some messages to high-profile users to ask them to stop posting photos from Instagram, with the message stating that posting photos from within Twitter directly would make sure that fans would "always see them".

The in-app alert included a couple of example screenshots of the same post, showing that photos within Twitter appeared instantly while Instagram photos had to be linked to. Instagram has recently announced that it has 300 million active users so it's perhaps not surprising that Twitter is trying to defend its own position as a potential multimedia social solution.

Microsoft Profit Hit

Microsoft's profits took a dive by over 10% for the final quarter of 2014 compared with 2013, with the company placing the blame for the dip on reorganisation following the Nokia acquisition.

Sales were actually better than expected with the Xbox's christmas spike helping to boost things, as 6.6 million consoles were sold during the quarter. Expect Windows 10 this year to help lend Microsoft a timely boost too.

Wales: Wikipedia Should Be Taught In Schools

Jimmy wants students to be taught how to use encyclopedia

Wikipedia's co-founder Jimmy Wales has hit out against Wikipedia being banned from school use by going as far as saying that he thinks that students should be taught how to use the online encyclopedia.

Wales is keen to point out the benefits of using the site as more than a reference source, stating that whether or not Wikipedia is banned in schools students are always going to visit the site anyway. "A hundred percent of all students are using Wikipedia. This debate that we used

to have five years ago about should students use Wikipedia or not is frankly irrelevant. They are using Wikipedia. It's just a fact of reality," said Wales at a London conference event.

Wales feels that schools and universities should be teaching students how to use Wikipedia in the same way that they would use any encyclopedia, rather than simply citing the website as a source in itself. "It's where you go to get started," he said. His big idea is that students will eventually contribute to the site and help it to grow and improve further.

Android Office Alternative Now Free

Full Office Mobile package from Google Play

A late Christmas present for Android mobile users now as our German friends over at SoftMaker Software have made their Office Mobile suite available for download from the Google Play store for free.

The suite was previously available on a paid-for basis, but no more. Now, this full office suite – Including TextMaker Mobile, Planmaker Mobile and Presentations Mobile in the one suite – can be grabbed for nothing. It's fully compatible with Microsoft's own suite of applications and is, so say the developers, a

fine choice for professional document editing on the go, supporting both .doc and .docx-style formats. This means it will save docs without any loss of formatting or layout and files can be exchanged between a PC and Android device with ease.

Functionality includes access to Dropbox, OneDrive and GoogleDrive from within the app and with options such as track changes, a multilingual spell checker and footnote and endnote creation – and hey, when software's free, it's at least worth a gander, right? Do so over at www.softmaker.com.

Starbucks Powers Phones

Charge stations at ten London locations

Ubiquitous coffee shop chain Starbucks has teamed with Powermat to provide wireless charging stations for ten central London locations.

Why? Well, the broader idea is that customers can utilise these particular coffee shops as office hotspots for workers on the go. Powermat, for the uninitiated, is a wireless technology that charges mobile phones with a ring accessory attached to them. By placing those rings on a table fitted out with the technology built in, the

phone charges up and, hey bingo, you're happy. Working with iOS, Android and Windows Phone, the ring accessories themselves will be sold to interested customers for a tenner following a demo period in store.

Presumably, if this goes well, we might be seeing this rolled out across more Starbucks stores in time.



Hungary Blocked From Football Facebook Page

Sharp rise in interest forces drastic action

Blocking people on social media is nothing new but this story is a little bit different. For Notts County football club, it wasn't enough to simply block the odd person or group of people from its Facebook page. No, it decided to block an entire country.

Yes, the whole of Hungary was blocked from the club's page following the signing of a Hungarian player, after which the page was inundated with comments from Hungarian football fans, so inundated in fact that Notts County couldn't cope. The "unprecedented" amount

of web traffic it received meant that, despite attempts to keep traffic down by blocking particular keywords, all potential commenters from Hungary eventually had to be blocked. Seems a bit drastic to us.



Facebook: It Was Us; Not Hackers

Global outage blamed on engineers

When Facebook went down across the world on 27 January. The Lizard Squad wasn't responsible. For once. Apparently.

The Facebook service outage, which also impacted Instagram, meant that users were blocked from being able to update the digital universe on their everyday lives and rumours were abound that this may have been the work of hackers, possibly the Lizard Squad. This speculation was further fuelled by a tweet

from the Squad suggesting that it was indeed involved. But no, the fault was all Facebook's.

Specifically, the outage happened because of a "change that affected our configuration systems" and we guess we should all be thankful to Facebook's engineers for fixing the problem as quickly as it did. An hour's outage isn't as bad as all that and it did at least give Facebook addicts a breather from endless status updates on their every move.

Samsung Portable SSD T1 Series 250GB

Samsung takes its SSD technology on the road

DETAILS

- Price: £136.99
- Manufacturer: Samsung
- Website: www.samsung.com/
- Required spec: PC with USB 3.0 port

Always looking for new ways to ship flash memory modules in volume, Samsung has just launched its T1 Series portable SSD.

What struck me initially is that I've been using 2.5" SSD drives in USB 3.0 caddies for at least three years, yet it is only recently that the module makers have woken up to this common activity.

To be fair, the T1 series is slightly different in that Samsung has used what appears to be an mSATA module inside a custom case, making the whole ensemble marginally smaller.

That's an assertion based on an exploded graphic Samsung provided, because the review T1 250GB had no inclination to come apart for me to explore inside.

Available in 250GB, 500GB and 1TB sizes, the T1 is meant to provide high-performance portable storage for anyone who has overloaded their laptop or has plenty of data to carry around with them.

The drive comes with a very short cable for connecting to a USB 3.0 port – something that's a necessity if you're to see any of its high-performance abilities.

According to Samsung, the units, regardless of capacity, are rated for 450MB/s read and write, with random read/write speeds of up to 8,000 inputs/outputs per second (IOPS) and 21,000 IOPS respectively. I'm sure, as an mSATA module, those numbers are accurate, but try as I might with USB 3.0 between this and the PC, those numbers are mildly optimistic.

The best I managed was 367MB/s reading and 356MB/s writing, and to achieve that it was necessary to activate UASP mode on the PC. While not

quite as promoted, those are still good numbers, and make the launching of applications from the device entirely practical.

The snag with this product for this reviewer is the price, even if it was reduced markedly shortly before release. It's still too high when compared with Samsung's own products.

A quick search on a popular online vendor revealed that the 2.5" format Samsung 250GB 840 EVO costs just £96.99. A good quality caddy costs less than £20, and you've got the same, or actually a better, solution for £20 less. And with the caddy solution you have the flexibility to remove the drive and place it in your PC without needing an adapter.

The cost savings are replicated on the 500GB and 1TB 840 EVO,

with the latter costing just £320 inclusive of the caddy versus £456.99 as a T1. That's a big difference, even if the T1 module uses Samsung's proprietary 3D Vertical NAND (V-NAND) tech, whereas the 840 EVO uses older Samsung Toggle DDR 2.0 NAND.

The only real edge the T1 has is that it's smaller, but not by a massive amount.

At £100 for the 250GB model, I'd have been more positive about this product, so it will be interesting to see how rapidly the T1 gets to that level in the coming months.

mm Mark Pickavance

Quick, stylish but pricey portable flash storage



Capacity	Part No.	Cost
250GB	MU-PS250B/EU	£136.99
500GB	MU-PS500B/EU	£228.99
1TB	MU-PS1T0B/EU	£456.99

Zoner Photo Studio 17

Organise and edit your digital camera and phone photos. Roland Waddilove takes a close look at Zoner's latest toolkit

DETAILS

- Price: £63.49
- Manufacturer: Zoner
- Website: zoner.com
- Required spec: Windows XP or later, 1GB RAM, 1GHz CPU, 350MB disk space

Zoner Photo Studio has grown from a simple image organiser into a multi-function toolkit with a wide range of features. The idea is that it's a one-stop shop for all your photo requirements. This latest version packs in more features than ever, but it has a price that is close to Adobe Photoshop Elements and Corel Paintshop Pro X7 Ultimate, which are both excellent and tough competitors.

Zoner gets off to a good start, and accessing your photos is very easy. If you have the free Android app on your phone, you can browse them directly from your computer with no syncing or transferring required. Using the Navigator panel on the left, you can select the cloud option and browse your phone photos, load them into the editor and work on them like they were on the PC's disk. Networked PCs can be accessed from the Navigator, and you can connect to a PC, open the Public Pictures folder, browse them and load them. It imports from cameras, scanners, PDFs and more.

The My Pictures folder on the PC's disk can be shared, and one click starts a DLNA server. DLNA clients on a phone, tablet, television or computer can then access your photos. The Navigator also shows a photo timeline with images organised by date. Photos are shown as thumbnails, and two



▲ Editing a photo with the light interface selected



▲ Browsing photos in the manager with the dark interface selected

locations can be viewed side by side. Titles, descriptions and keywords are easily added and there are batch facilities enabling actions like renaming or file type conversion to be applied to multiple images. It's a flexible and powerful organiser for your photos.

Zoner Photo Studio has an extensive array of editing tools too. To mention just a few, there are quick fixes, levels,

curves, colour temperature adjustment, exposure enhancement, sharpen, blur, chromatic aberration, barrel and pincushion fix and more. In addition to this, there's a comprehensive collection of tools. There are too many to mention, but to give you an idea, there's a text tool, predefined shapes, lines, deform, morphing mesh, clone, paintbrush, eraser, seven

different selection tools, healing brush, red-eye reduction and so on.

The tools are good and there are lots of options. For example, the paintbrush has diameter, opacity, density, blur, spacing, colour and mode. There's limited support for layers, but you can create a layer by pasting in a selection from another image, add text or shapes and so on, choose how layers are mixed and set the transparency. Zoner's interface has different colour schemes, panels that can be shown, hidden and resized, multiple tabs for editing several photos, plus an organiser tab.

New features in version 17 include an exposure gradient filter for changing the exposure of only part of an image, such as where the sky is too light or the ground too dark. Smart automatic edits choose the best tweaks, and there are more and better tools for working with RAW photos that the better digital cameras can save.

The more you use Zoner, the more it grows on you, and it's a powerful program that is an interesting alternative to Photoshop Elements and Paintshop Pro.

mm Roland Waddilove

A great photo organiser and editor that has a good range of features



Acer Aspire Switch 11

Can Acer make the hybrid PC an affordable option?

DETAILS

- Price: £329 (Amazon)
- Manufacturer: Acer
- Website: www.acer.co.uk
- Model reviewed: Aspire Switch 11 SW5-111

Having recently covered the high-end Dell Latitude 7350, I've been interested in seeing a similar concept that doesn't cost nearly a grand.

The Acer Aspire Switch 11 has many design similarities but costs just a third of the Dell. The Acer might be more affordable, but does it address any of the other issues?

What we have here is another in the long list of Microsoft Surface-like designs, where the machine will operate as both a tablet and a laptop, depending on your specific needs.

The review model is the lower-spec version of the Switch 11, which uses a 1.33GHz Intel Atom Z3745 quad-core CPU, has 2GB of RAM and 32GB of flash memory and a 500GB hard drive for storage. There's a high-end option that uses the

Core i3 i3-4012Y dual-core, which has double the RAM, a 1080p display and a 60GB SSD drive, but it costs twice the review model's price.

Even using the Atom, I wasn't immediately drawn to conclude this design was underpowered, but then it only has a 1366 x 768 display to drive.

Where this design is different from what Dell did is that the keyboard part of this

solution is mostly just that – an input device. There are no batteries in the keyboard and only a single USB port, though I later discovered that it did have one other critical part inside it.

vertical. That said, it's still more stable than the Surface with its flexible keyboards attached.

Pre-installed is Windows 8.1, though it took the installation of more than 70 patches before the computer

“To move the Windows button off the tablet face, it been put on the left edge”

Separating the keyboard results in the disappearance of the 500GB hard drive and a system complaint that you should have ejected it first.

Even with what hardware is in the keyboard, it's rather light in comparison with the rest of the system, making it somewhat unstable when the screen is tilted much out of the

was truly ready to use. At that point, only 14GB of the 32GB storage was left for my use, with over 10GB being disappeared to a recovery partition. Storage can be supplemented through a micro-SD card, but with the hard drive accessible with the keyboard, there seems little point unless



you're determined to use it exclusively in tablet mode.

For general office use, the system speed isn't blazing, but it is workable for accessing the internet and typing modest documents. The 11" display also isn't suitable for working on large spreadsheets or photos, though I found it surprisingly sharp and clear.

The build, while mostly plastic isn't rubbish, and the metal skin facing the back of the screen gives the impression of a much higher-end device.

However, at 11mm thick, the tablet isn't going to concern Apple, and with the keyboard attached the system becomes a rather chunky 28.4mm deep and weight a portly 1.6kg.

Girth aside, the true weaknesses in this design are all familiar ones to those who've looked at any number of hybrid machines. The worst crimes against technology are the USB port – or rather their rarity.

The tablet part has a single micro-USB port and the



keyboard just one full-size port. They're also both only USB 2.0 standard, even if the hard drive in the keyboard inexplicably connects via USB 3.0. So it has this tech built in, but won't give the user any access.

There are two other howlers on the tablet design that I find it hard to accept those developing the machine didn't notice. The first of these is that to move the Windows button off the tablet face, it been put on the left edge. It's almost identically sized to the power button and next to it, resulting in the joy of turning the system off when trying to return to the tiled menu.

The other mistake is that the Acer logo has been placed on the tablet back, and it has a serrated finish that feels horrible when your fingers come into contact with it, as they often do.

Putting those points aside, this is simply a modern netbook that can transform into a tablet when and if required. That idea falls down, as I've said before, because the Windows 8 tablet experience isn't comparable with either Apple or Android

at this time, so why would you want one?

That's annoying, because in value for money terms, the Switch 11 seems a fantastic deal, even if some of the technical design details were ill-considered.

This machine is significantly better than the Switch 10 that it effectively replaces, though I'm still not sure, even at this price, that I've seen a concrete reason to want one.

mm Mark Pickavance

A hybrid tablet/PC that doesn't make a compelling case for either



Cougar 200M Mouse and 200K Gaming Keyboard

Cougar launches a pair of inexpensive gaming peripherals

DETAILS

- Price: £29.52 Keyboard (CCL) £19.34 Mouse (CCL)
- Manufacturer: Cougar
- Website: cougar-world.com
- Required spec: PC with USB

Gaming mice and keyboards can be costly items, depending on what brands and features you're interested in.

So when you're sent a mouse and keyboard that aren't a combo, and their retail value is less than £50 combined, there's a natural scepticism about exactly how good they might be.

Cougar started in Germany in 2007 and has been producing stylish gaming peripherals for some time now, selling them in Europe, Asia and the Americas. Along with keyboards and mice, it also manufactures PSUs, cases, fans and a range of universal notebook adapters.

The 200M mouse and 200K keyboard are the first of its products Micro Mart has reviewed, and I'll start with the keyboard.

Cougar 200K Keyboard

In terms of gaming exotica, the 200K initially seems rather modest. It's a simple but elegant layout that uses the scissor-switch mechanism on each of its 106 keys (UK layout). Having used the 200K keyboard to type this review, I'm not convinced that it's



“ It's possible with a single key stroke to flip the WASD keys ”

ideal for long-term typing, but for gaming it's fine.

There's an easily identifiable clunk at the end of the key action, and it's slightly cushioned at full extent to lessen the repeated impact on your fingers.

Being a gaming product, it has some more glitzy features, like backlighting – a necessity for late-night gaming sessions. At this price

it was never going to be very sophisticated illumination, but there are seven different colours it can be lit in, and you can disable it entirely if you wish. It can also do a 'breathing' mode where the light pulses for effect.

More interesting to the hardened gamer are likely to be the anti-ghosting technology and key remapping functionality. As an

exclusively USB device, anti-ghosting tech is included on the most gaming active 19 keys so that simultaneous key presses aren't lost or oddly transcribed.

In addition, it's possible with a single key stroke to flip the WASD keys for the cursor cluster – something many left-handed players are forced to do through game configuration. Another special key action can also lock the Windows key from an accidental press, and you can increase the repeat rate.

On other gaming keyboards, these features usually require a Windows application, but here they're all inherent, so they'd work regardless of the OS you're using.

Where this keyboard differs from more expensive gaming options is in the general build quality. It's not badly made, but the amount of twist I could create with relatively little force suggests that Cougar needs to look at stiffening the structure further.

For the occasional gamer, the 200K is acceptable,

An inexpensive gaming keyboard with some good features





but for those who play on a regular basis this design probably isn't robust enough for extreme abuse.

Cougar 200M Mouse

The build quality of the 200K keyboard is mirrored, unsurprisingly in Cougar's 200M gaming mouse. It's a wholly plastic construction, though Cougar did use a good specification braided cable for the USB connection.

Like the keyboard there is lighting, but it's exclusively orange in this case, and the backlit Cougar logo is actually obscured when in use.

Technically, the 200M's credentials as a gaming mouse come mostly from the high dpi optical sensor that can poll movement at

“ The build quality of the 200K keyboard is mirrored in the 200M gaming mouse ”

800, 1600 or 2000dpi. One of the six buttons switches between these modes, and unfortunately this is the one part of this design I didn't really like. The mode change button is positioned directly behind the thumbwheel, where it's far too easy to hit it in the frenzy of combat.

Moving from 2000dpi unexpectedly to 800dpi in mid game could be very jarring, and there is no visual feedback

to indicate what speed you've set other than the relative speed of the pointer.

That's one issue, and the other is that for such a highly sensitive device, it's way too light, resulting in many over-control problems in this reviewer's hands. With some built-in or installable counter weights, this could be a very precise mouse, but currently it is very easy to move it unintentionally.

What does work for this reviewer is undoubtedly the price, being a least a tenner cheaper than most gaming mice, and a small fraction of what they can go for.

The review model was orange and black, but those who find striking colours upsetting can also buy it just in black.

Conclusions

I feel somewhat harsh being critical of such cheap devices, but I'd like to think anyone buying them needs to know where their limitations are.

Of the two, I liked the keyboard most, as it has some decent functionality and looks rather attractive when connected.

The 200M mouse I found less compelling, though it would certainly help a young gamer moving from a typical standard 800-1000dpi device.

mm Mark Pickavance

A high dpi mouse design that lacks any great finesse



HUB-IT

Mr Fereday has been collecting a range of devices for mass charging

DETAILS

- Price: £79.99
- Manufacturer: Eggtronic
- Website: www.eggtronic.com
- Required spec: n.a.

Many households now tend to be home to a variety of mobile devices that require access to available power sources on a regular basis. Offering to provide a means of reducing arguments over who has access to power points while centralising charging activity is a product from Eggtronic. This item is the HUB-IT, which allows up to seven different devices to be connected for charging from a single source.

The plinth-like HUB-IT is a lacquered black box with base dimensions of 162 x 168mm. The HUB-IT takes a modular approach to its functionality by allowing you to add and remove features. By releasing the top of this box, held in place by four retaining clips, which seem flimsy but can withstand a certain amount of pressure, you're faced with space to insert nine cartridges, designed for specific purposes, in a three-by-three arrangement.

Each cartridge slot has its own socket into which pins need to be inserted to ensure the cartridge is positioned the correct way round. Inserting a cartridge is straightforward. Four of these slots are open, giving access to various connection features, while the other five slots are totally closed and are for storage or



use by features not requiring immediate access.

By default, the HUB-IT comes supplied with a standard selection of four cartridges already mounted on the base device. These cartridges, occupying the four available open slots, provide an array of USB 3.0, micro-USB, mini-USB options, plus Apple Lightning and an Apple Dock 30-pin connection with a socket for linking the supplied AC DC 5V 4A power adapter to an appropriate mains power source.

Using the various connection options from the cartridges mounted in the open slots, you can attach up to seven different devices

for simultaneous charging, if needs be. The HUB-IT can deliver output of 2.5A from each port at a speed of up to 5Gbps, depending on the attached device. These items could be the smartphones and tablets owned by each family member or a camera, camcorder, MP3 player and even a portable battery charger for when you are out and about.

Recently, Eggtronic has added a new cartridge to its product listing. This is the Qi Wireless Charging cartridge. With this inserted, you just need to position an appropriate device on top of the HUB-IT for it to be charged wirelessly. As this

cartridge does not require a visible outlet, it's a candidate for inserting into one of the enclosed slot.

With its available nine cartridge slots, there is plenty of space for adding functionality to the HUB-IT. I know of two other cartridges that Eggtronic is developing, although I have been informed that one of these cartridges has currently been placed on the back-burner for the time being.

There is mention in the product's user manual of a battery cartridge, which is meant to allow the HUB-IT to be used when a mains power source is unavailable. Unfortunately this cartridge has yet to be launched, and its appearance has slipped down the pecking order, as Eggtronic still feels work needs to be done on the amount of power this cartridge can deliver. The company is also working on a Bluetooth audio loudspeaker cartridge, and this is currently scheduled to appear before the battery cartridge.

mm Michael Fereday

A useful tool if you have multiple devices fighting for access to a power source



Lindy USB 3.0 To SATA-3 Drive Adapter

Tired of large external drive caddies? Time for something smaller and faster

DETAILS

- Price: £39.98
- Manufacturer: Lindy
- Website: goo.gl/YZLK8H
- Required spec: USB 3.0 port for best speeds, 2.5"/3.5"/5.25" SATA-3 drive

We often have the problem of suddenly coming across an old hard drive, found in the bottom of a drawer, and wanting to know its contents without having to open up a PC case and fit it. Similarly, we have a few spare, smaller capacity SSDs lying around that could be put to good use as backup drives. Again, though, we don't fancy cracking open the case to fit the drive.

There are, of course, a number of solutions available that allow us to connect a SATA hard drive to a USB port. Some are cradle devices; others are just simple cables with different ends. Most, however, rely on older USB and SATA technology, except for this device from Lindy.

The Lindy USB 3.0 to SATA-3 Drive Adapter, as the name suggests, allows you to connect a SATA-3 drive to your PC via a USB cable. The result is a far better data transfer speed in a neat, convenient package.

The adapter consists of a single unit, with a SATA-3 connection fitted against the side and a built-in USB 3.0 cable and power port for the accompanying power brick, protruding from the end. There's a large LED on the top of the adapter, indicating power, access and data transfer with a pair of red and blue LEDs.



▲ The Lindy USB 3.0 to SATA-3 Drive Adapter is a lightweight, simple device that's very effective

All you need to do is fit a suitable SATA-3 drive into the SATA slot, plug in the USB 3.0 cable to a PC and plug in the power. The drive will then be recognised by Windows or any other OS, and you can then manage it as you see fit. When you're done, you can either take

4KB, scored 93MB/s write speed and 55MB/s read.

When connected to a USB 2.0 port, the 8MB test managed to hit 42MB/s write and read, with 18MB/s write and 16MB/s read on the 4KB test. Incidentally, with a 7200rpm hard drive in place, we scored a more than

desk without you having to fiddle around too much. And naturally the added bonus of the faster USB 3.0 speeds on offer are appealing to those who regularly transfer large amounts of data.

In short, it's a handy device – one that any IT technician would be happy to have as part of their toolbox or to bring an otherwise defunct drive back to life. And all for a pretty good price too.

mm David Hayward

“ Any IT technician would be happy to have it as part of their toolbox ”

the rough and ready way of uncoupling the drive by simply unplugging it, or you can opt to safely eject the USB hardware via the OS you're working on.

With an older OCZ Agility 60GB SSD attached to the device and connected to our PC via a USB 3.0 port, we managed to get a fairly decent ATTO benchmark value of 325MB/s write speeds, and 295MB/s read on the 8MB test, while the smaller file test,

reasonable USB 3.0 benchmark of 90MB/s write, and 95MB/s read on the 8MB test. Suffice to say, there's enough speed and stability here for use as a dedicated external backup solution or drive cloning setup.

We were quite pleased with the Lindy USB 3.0 to SATA-3 Drive Adapter. It's an simple little unit, with enough cable length both on the USB 3.0 cable and power to sit comfortably on your

A handy, fast and uncomplicated device to connect SATA-3 drives externally



GROUP TEST

Four-Bay NAS Drives

NAS drives have evolved into more than just a way to share a few files and folders. These days, many are able to transcode and stream media to multiple device at once, and they can become a surveillance station, a download centre or one of the most powerful media centres you're likely to ever use.

Four-bay NAS drives offer all this, plus the many benefits of RAID setups. David Hayward hooked up six of them to his network to see what they're made of.

Four-Bay NAS Drives

QNAP TS-451

DETAILS

- Price: £385.39
- Manufacturer: QNAP
- Website: goo.gl/jtT1Y6
- Required spec: Up to four SATA-3 drives, gigabit network for best results, any modern

The modern home NAS solution has evolved over the last couple of years into something rather extraordinary. No longer are they simply networked boxes housing a hard drive and serving your collection of media; there's considerably more that the home and small office user demands from their networked storage solution.

QNAP has therefore pulled out all the stops and is now offering a complete package in the form of the TS-451. This is an extremely high-performance and high-capacity networked storage solution that takes the traditional operation of the NAS device and turns it on its head.

Inside this four-bay NAS you'll find a 2.41GHz dual-core Intel Celeron CPU and either 1GB of DDR3L RAM or 4GB in the 4G version – both of which are expandable up to 8GB – along with 512MB of flash memory. You can fit four 3.5" or 2.5" SATA-3 drives in the hot swap cradles, which slide into the unit and lock into position.

The rear of the TS-451 features a HDMI port, a pair of gigabit Ethernet ports, two USB 2.0 ports and a single USB 3.0 port, along with the power and a pin-hole reset. The front contains a further single USB 3.0 port, the power button, one-touch copy button, a strip of LED indicators and of course the four-drive bay slots.



▲ The QNAP TS-451 is a superb, lightning quick and capable NAS and media machine

Driving all this is a customised embedded Linux operating system called QTS 4.1. We've mentioned the QTS OS before in various reviews of QNAP NAS drives, and it's as solid as ever. The number of available apps increases almost daily and cover a wealth of useful system, media, entertainment and server orientated functions. It's basically an extremely capable and smart interface, which makes it easy to configure and use.

The services the TS-451 offers via the NAS Management facility includes the usual DLNA server, but with the added ability to hardware transcode video in real time to up to five different devices simultaneously. In addition to the DLNA side of things, the HDMI port enables the TS-451 to become a dedicated media machine, capable of hooking up directly to a TV and using XBMC v12 through the QNAP HD Station app; you can even use your phone or tablet as a remote.

In addition to all that, there's also a VPN service, MySQL

server, network based surveillance station and server, and many more services via the QNAP App Centre, such as virtualisation, Dropbox support, Google Drive sync, Drupal and even an app version of *Super Mario Bros*.

The installation of the TS-451, with four drives fitted, is very quick indeed. Within a matter of five minutes we had a set of 1TB drives wiped and RAIDed and were back on the login screen ready for a system update and the installation of some selected apps. Obviously the Celeron CPU and 1GB RAM help push the TS-451 along at a reasonable speed and keep that performance up even when the device is pushed to the limit through serving media, transcoding and when being used as a web and backup server.

The QNAP TS-451 is an immensely impressive NAS drive. There's far too much going on to mention in a single page, but suffice to say it's ideal for the home or office.



Lenovo lomega ix4-300d

DETAILS

- Price: £123.17
- Manufacturer: Lenovo lomega
- Website: goo.gl/dhhXvi
- Required spec: Up to four SATA-2 drives, gigabit network for best results, any modern web browser

Lenovo is a name that most older computer users are more than familiar with, since it harks back to the time of the much maligned but still excellent (at the time) Zip drives.

Things have moved on since those early days, and Lenovo now owns what's left of lomega. The storage skills and know-how of the old company are still in effect, though, as we can see from this entry.

The ix4-300d comes across as a more business-orientated four-bay NAS drive, but there's still plenty in here that can satisfy the home user. Inside you'll find a Marvell Armada MV78230 XP CPU running at 1.3GHz, together with 512MB of DDR3 memory.

Connectivity comes in the form of a pair of gigabit Ethernet ports and three USB ports, of which one is USB 3.0. And of course, there are four drive bays that can receive 3.5" SATA-2 disks of varying sizes up to 16TB – although the unit had been fitted with four 1TB drives.

Obviously you can have all manner of RAID levels, which are relatively easy to configure in the web-based management console. Our four drives came already formatted and RAIDed, and breaking and reconfiguring this took a considerable amount of time – just over three hours to be exact.

There are various NAS services on offer through the

▲ *Although a good NAS drive, the Lenovo lomega does have some odd design features*

▲ *It was a little slow at times as well*

interface, such as a cloud solution, surveillance, FTP, print server and the usual fare of file and folder sharing with varying user access. Unfortunately, though, we couldn't get the DLNA service working and, as a result, we were forced to browse to media content

through a file manager. It was quite annoying really and not as well designed as the previously reviewed QNAP QTS OS example we've already become accustomed to.

The design of the ix4-300d is an anonymous looking black box, but with a digital readout

on the front that can display the lomega logo, current IP address and the like. While the design is workable, we did find it unnecessarily inconvenient to have to remove the outer case in order to access or fit the drives, which are side mounted horizontally. Where a lot of NAS drives these days have taken a leaf from the enterprise server room, in that you can quickly and conveniently whip out a faulty drive and slide a new one in place in a blink of eye, Lenovo lomega has instead opted for a more cold-swap setup. It's not necessarily a bad thing, but it does mean you'll have to unplug everything before gaining access to the drives.

While we're on the subject of nit-picking, we did find the management interface a little too slow to respond at times. Whether this is because we've already, as we said earlier, been spoiled with the flashy and very responsive QTS interface from QNAP, we're not entirely sure. Switching from one service to the next was okay; it's just whenever something needed to be applied, like a service change, the system seemed to grind to a halt, which also affected the serving capabilities too.

Overall, while the Lenovo lomega ix4-300d is a reasonably priced and generally good NAS drive, it's not as well designed as some of the other models we've seen.



Four-Bay NAS Drives

D-Link DNS-345 ShareCentre+

DETAILS

- Price: £131.99
- Manufacturer: D-Link
- Website: goo.gl/p9eAyJ
- Required spec: Up to four SATA-2 drives, gigabit network for best results, any modern web browser

D-Link has become one of the more successful names in smaller storage solutions for quite some time now. Its range of desktop, external drives and single-drive NAS solutions are enough to fill several pages. Most consumers, though, tend to overlook the bigger, more complex entries from D-Link, such as this four-bay unit.

The DNS-345 ShareCentre+ is designed to be a low-cost, high-performance and straightforward solution for sharing all manner of data. Inside is a rather old Marvell 88F6707 processor at 1.2GHz, with 128MB of system memory. There's pair of gigabit Ethernet ports and, extraordinarily for a modern NAS unit, only a single USB 2.0 port.

The four bays can hold 3.5" SATA-2 drives up to a maximum of 3TB each, with RAID levels 0, 1, 5, 10, 5 and a hot spare, JBOD and standard, with each drive being fitted through the removable front face of the unit horizontally either side of the OLED display screen.

The NAS management software is certainly comprehensive enough and features just about every possible sharing service you could possibly name. It was also fairly easy to get up and running through the web-based console. Interestingly, despite this model being somewhat underpowered



▲ The D-Link DNS-345 is an okay NAS drive, just a bit average really

▲ Strange to see only a single USB port too

compared to the previous example from Lenovo Iomega, it zipped through the menus and applied any changes to the system considerably quicker.

Formatting four 2TB disks took about 30 minutes with RAID5, but oddly they could

was fine, but once two more users accessed the drive for various services, we did notice some screen tearing and a loss in content delivery.

We also noticed an entire device slow-down when we used the surveillance Centre

of a USB port spare for syncing or specialised printing duties. All in all, the specifications and hardware on the DNS-345 are just a little too thin on the ground for this to stand toe to toe against the QNAP or even the Iomega NAS drives.

If you require a more comprehensive four-bay NAS solution, then we would recommend you pay a little more and opt for the QNAP or Synology examples. If you're after a cheap solution that will sit in a darkened room for all eternity and never likely be touched again, then the DNS-345 may have a home.

“ The lack of an extra couple of USB ports is a bit of an annoyance ”

only be accessed and managed once the device had been rebooted. Once up and running, though, they were fairly good in their operation, although they were a lot noisier and generated a fair amount of heat compared to the QNAP model.

The older CPU and limited amount of memory did slow things down a little when the device was being used by multiple users. Watching a single instance of a HD movie

App and accessed the pair of DCS-7000L cameras we had available. The result was such that copying files to the device dropped to less than 700KB per second, as opposed to the previous 11MB/s we were enjoying beforehand.

The lack of an extra couple of USB ports is a bit of an annoyance too. We've seen plenty of examples where an external USB drive is permanently plugged in, on top



Synology DS415Play

DETAILS

- Price: £382.39
- Manufacturer: Synology
- Website: goo.gl/MhDWV2
- Required spec: Up to four SATA-3 drives, gigabit network for best results, any modern web browser



▲ The Synology DS415Play is an extraordinarily sleek NAS drive



▲ The excellent design extends to the software level

“ The Synology DS415Play is an extremely capable and excellent NAS drive ”

We reviewed the Synology DS415+ some months ago now and were extremely impressed by its capabilities. However, while the 415+ is a more enterprise or SOHO-orientated product, the DS415Play is clearly a home-based offering.

The DS415Play is labelled as being the ultimate media centre, and while that may sound a little extreme and self-confident, it's not too far from the truth.

Inside this four-bay NAS drive you'll find an Intel Atom CE5335, dual-core 1.6GHz CPU, complete with 1GB of DDR3 RAM and dedicated hardware-based transcoding engine that can handle H.264, MPEG-4, MPEG-2 and VC-1.

The drive bays, which are accessed via the removable glossy black cover, are vertically stacked and can take a combination of 2.5" SSD or 3.5" SATA-3 traditional hard drives, up to a maximum raw capacity of 24TB.

You'll also find three USB 2.0 ports, two USB 3.0 ports and a single gigabit Ethernet port. There's a pair of large, 92mm fans located on the back of the unit that remove any excess heat generated from the much abused quartet of drives. And thanks to the excellent Synology DiskStation Manager operating system, there are also ample

services and apps that can be applied or downloaded and added with a click of a button.

The entire setup is really very good indeed, especially the DiskStation Manager OS. Like its competition, the QTS OS from QNAP, DSM is a Linux operating system that's entirely

accessible via a web browser, and it allows you to configure and manipulate nearly every aspect of the unit and the connected drives to the finest degree. It's also lightning fast, not just when browsing through the various settings but also when you apply a

change to the system or the drives themselves.

Formatting and RAIDing four 1TB drives took mere minutes (around six to be exact), and the entire setup was ready to go as soon as the whole process had completed. Further to this, installing and running any of the apps – whether they're security, backup or media related – was a breeze, both in ease and completion speed.

Even with an anti-virus scanner installed, along with all manner of FTP, cloud and backup services running, we still managed to view eight different HD movies on as many different devices without the drive even remotely considering this as an issue.

It's very easy to compare the Synology DS415Play with the QNAP TS-451, as they are both exceedingly quick, easy and feature an abundance of services and extras. The only hardware aspect that the Synology is lacking when compared to the QNAP example is the HDMI port and the ability for it to be a dedicated media centre (as in physically connected to a TV).

The Synology DS415Play is an extremely capable and excellent NAS drive. It's well designed, easy to use, compact enough to exist in the living room, very powerful and can be expanded to cater for nigh-on any user's wishes and whims.



Four-Bay NAS Drives

Thecus N4100EVO

DETAILS

- Price: £578.99 (with four 4TB drives installed)
- Manufacturer: Thecus
- Website: goo.gl/gLc0vH
- Required spec: Up to four SATA-2 drives, gigabit network for best results, any modern web browser

You can be forgiven for never having heard of the company Thecus before, we hadn't until this group test. However, this is a company that has spent the last ten years or so in research and designing the best possible storage solutions for both the home and business user alike. They should be pretty good, then.

Inside the Thecus N4100EVO you'll find a dual-core Cavium CNS3420 ARM11 CPU, running at 600MHz and supported with 256MB of DDR2 RAM. In addition to that, there are a pair of gigabit Ethernet ports, two USB 2.0 ports – one on the front, the other on the rear of the drive – and an LED strip along the bottom front of the drive that indicates various system messages along with the system model number and current IP address.

Accessing the drives if done through a removable window at the front, with the drives being placed horizontally. It's a tool-free design, much like the other NAS units we've already tested, but in this instance you have to really push the drive cradle back until it makes a rather uncomfortable crunch to get it home and attached.

Setting up the drives, once they're fitted, is easy enough through the configuration



▲ There's a fair amount wrong with the Thecus N4100EVO – the noise levels in particular

▲ It's also very slow

manager accessible via a browser. Granted, it's nowhere near as intuitive as QTS or DSM from QNAP and Synology. In fact, it's quite reminiscent of an early Netgear router setup, but as long as you know what to look for and you know what you're doing, it's easy

performance.

We weren't overly convinced of the RAID performance accelerator, since it took nearly two hours to format and RAID the four 4TB drives we had installed. And then we were equally surprised to see that no matter what

being dished out by the unit. It would probably have been quieter to lay the drives out bare on the desk than have them sat in the chassis. There was even some vibration from the covering of the unit over the internal framework.

In the end, we had to give up on the Thecus N4100EVO. Despite the large capacity drives available (you can also buy a driveless unit), the NAS drive itself wasn't really capable of competing next to the other units we've already tested, never mind the Synology and QNAP entries.

“ It would probably have been quieter to lay the drives out bare on the desk ”

enough.

The services and features on offer are the basic NAS fare: DLNA media server, backup and syncing software, surveillance software and the usual file and folder sharing. Additionally, you'll find a copy of Acronis True Image and a RAID accelerator app, which uses a dedicated RAID chip to speed up the process of RAID array building and ongoing

we did with the drives took an absolute age. Copying a 2GB file was clocked at just 3MB/s, accessing any of the shares took nearly a minute for each folder and roughly half that time for any subfolders, and watching a HD movie was a waste of time due to stuttering, screen tearing and constant buffering.

The worst aspect, though, was the amount of noise



Zyxel NAS540

DETAILS

- Price: £221.99
- Manufacturer: Zyxel
- Website: goo.gl/aacDn1
- Required spec: Up to four SATA-3 drives, gigabit network for best results, any modern web browser

Zyxel has in the past delivered some great NAS drives. The NSA325V2, for example, was a fantastic little single bay NAS drive. Zyxel, though, has since scaled back on its home and personal devices, but this model now sees it starting to reignite that old phoenix-like fiery plumage.

The NAS540 is a compact and sleek-looking design with a 1.2GHz FreeScale FS1024 dual-core processor and 1GB of DDR3 RAM. There's a pair of gigabit Ethernet ports, three USB ports, a one-touch sync button and an SD card reader located under a flap on the front of the device.

The NAS540 is labelled as your Personal Cloud Storage, which to the users means that it comes with the necessary services to allow a connection from virtually any device and any platform. You can even sync with existing cloud services such as Google Drive, Memopal, ownCloud and, of course, Zyxel's own solution, the zCloud.

Other services are available, naturally. FTP, DLNA, iTunes, phpMyAdmin and user level file and folder sharing and security is all available through the much improved user interface, NAS Station Manager.

NSM is very much in a similar vein to that of QTS and DSM. The layout is roughly

▲ *The Zyxel NAS540 is a very stylish NAS drive*



▲ *It's also well balanced, in performance and features*

identical, as are many of the services and apps that are currently available. The only real difference here is that NSM doesn't run quite as fluidly and as quickly as QTS or DSM from QNAP and Synology, respectively.

However, it's certainly easy enough to use and understand, and if you've never used either of the other two NAS operating systems

before, you'll never know the difference. In short, it's quick enough for most users to use without having to wait for anything to initialise for several minutes.

Setting the drive up with our four 1TB drives was easy, with the whole format and RAID taking just over 30 minutes. It wasn't the quickest solution, but once everything was up and

running, we didn't have any problems with random slowdowns or any other speed or performance issues. But there were some niggles when we really hammered the drive with up to eight different devices, while copying a large 4GB file. The speeds dropped a fair bit; the copying went from the network speed limit of 11.5MB/s to around 5.5MB/s. Still, that was enough to keep watching content without any problems.

There are some design similarities between the NAS540 and the Synology entry, with the Zyxel version being only slightly more compact and having a single 120mm fan in the rear of the unit instead of the pair of 90mm ones in the Synology. It's a good design to adhere to, as we've already seen, because it remains looking somewhat stylish while keeping everything cool and exceptionally quiet.

We rather liked the Zyxel NAS540. A good design and an effective and intuitive NAS OS make for a good unit and one that's certainly worth looking more into.





QNAP TS-451

This was an exceptionally close run race between the QNAP TS-451 and the Synology DS415Play. Both are excellent NAS units, and both offer a huge range of features that cover home users, small office and even larger enterprises.

However, the additional HDMI port and media-level features gave the QNAP the slight edge over Synology this time around, from the point of view of the home user at least.



Synology DS415Play

Close on the heels of the QNAP is the Synology DS415Play. This is an excellent NAS drive, with many features available for everyone.

The other NAS manufacturers are going to have pull something very special out of the bag if they want a chance of even coming close to what Synology and QNAP can offer.

How We Tested

Each drive was connected to a standard 100Mb home network, using just a single Ethernet connection. Where needed, we used four 1TB WD drives in a RAID5 setup.

Each NAS drive had two tablets, two phones, a PS3, Xbox, media PC and smart TV connected, and we transferred both 2GB and 4GB files to and from various shared drives created within the management consoles of each unit.

	QNAP TS-451	Lenovo Iomega ix4-300d	D-Link DNS-345 Sharecentre+	Synology DS415Play	Thecus N4100EVO	Zyxel NAS540
Price	£385.39	£123.17	£131.99	£382.39	£578.99 (with 4x4GB drives)	£221.99
Max Storage Capacity	24TB	16GB	12TB	24TB	16TB	24TB
CPU	Dual Celeron 2.41GHz	Marvell Armada XP 1.3GHz	Marvell 88F6707 1.2GHz	Dual Atom 1.6GHz	Dual Cavium SoC 600MHz	Dual FreeScale 1.2GHz
Memory	Up to 8GB	512MB	128MB	1GB	256MB	1GB
USB	4 (2xUSB 3.0)	2 (1x USB 3.0)	1	5 (2x USB 3.0)	2	3x USB 3.0
HDMI	Yes	No	No	No	No	No
Card Reader	No	No	No	No	No	Yes
No. Of Gigabit Ports	2	2	2	1	2	2
Dimensions	177 x 180 x 235mm	168 x 196 x 206mm	128 x 200 x 178mm	165 x 203 x 233.2mm	226 x 165 x 192mm	190 x 225 x 160mm
Weight (With Four Drives)	4.3kg	5.12kg	4.2kg	4.1kg	5.6kg	4.3kg
Pivot	Yes	Yes	Yes	Yes	No	Yes
Weight	9.4kg	8.04kg	10.95kg	10kg	5.65kg	7.9kg

Tech Origins

Smart Watch

David Briddock examines the allure of a smart gadget on your wrist

The smartwatch has been immortalised popular culture from *Dick Tracy* to *Star Trek*, from *Knight Rider* to *Inspector Gadget* and in the James Bond films...

Encouraging Start

One of the first practical implementations was the Casio Calculator Watch. With its tiny keys it was a revered object in the school playground, at a time when calculators were banned in exams. Today similar Casio products are still available under the Databank brand (goo.gl/Sidzr4).

Yet, even back in the 1980s companies like Casio and Seiko were working on more advanced concepts with built-in databases, dictionaries, blood pressure sensors, touchscreens and even gesture control.

Information Stores

Seiko released the Data 2000 and UC-2000 in 1983 and 1984 respectively. These watches displayed text on tiny 4 x 10 character displays from a built-in 2,000 character store. Data was transferred from a keyboard dock via magnetic pulses.

The later Seiko RC-1000 offered a cable connection. So, it could be attached to a Commodore C64 to sync to-do lists, phone

numbers or other useful information. However, initial enthusiasm soon evaporated as consumers came to realise the limitations.

A few decades later Palm tried a digital assistant concept with its Wrist PDA, developed in partnership with watchmaker Fossil. Unfortunately, problems with the monochrome 160 x 160 pixel touchscreen caused launch delays, and by then its \$250 price was a tough sell.

Wrist Computer

IBM had a bigger vision when it teamed up with Citizen to create the Linux WatchPad in 2000. Powered by a 32-bit ARM processor, it also had 8MB RAM, 16MB of flash memory, a speaker and a microphone. The monochrome LCD display acted as a security fingerprint scanner, an accelerometer detected gestures and it supported Bluetooth for peer-to-peer communication with other computers.

However, in the end, it was rather too ambitious and IBM never launched a product based on this technology.

Inter-Connected

Microsoft's 2004 Smart Personal Object Technology (SPOT) smartwatch used MSN Direct networks running on FM radio

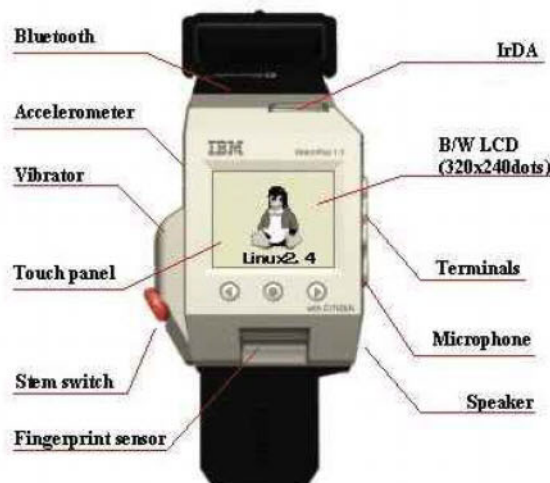
broadcast signals. Available in around 100 US and Canadian metropolitan areas, the service cost \$59 a year, and was compatible with smartwatches from Fossil and Suunto, then later Tissot and Swatch.

However, in 2008 Microsoft effectively pulled the plug on SPOT after manufacturers cancelled compatible watch production – although MSN Direct remained operational until January 2012.

Wrist Phone

AT&T successfully patented a wrist phone in 1993, but it failed to create a workable product. Samsung later had a go with its SPH-WP10, which had voice activated dialling, a phone directory, vibration alerts and a basic LCD display, but owners had to hold the large and chunky device in front of their face to make a call – and the battery only gave 90 minutes of talk time.

In 2009 Samsung released the S9110 as a direct competitor to the LG GD910. Features included a micro SIM card, 1.76" colour 176 x 220 pixel resolution screen, Bluetooth communications, MP3 player plus text and email capabilities via a tiny touchscreen keyboard. Yet the \$600 price tag (the LG GD910 was over \$1200) was still too high for buyers and it was quietly discontinued. [mm](#)



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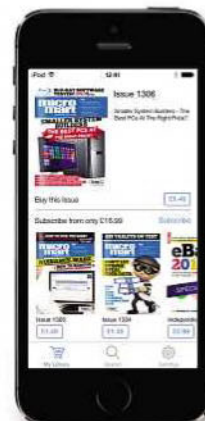
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Broken Age, Part 1

The Best Indie Games Of 2014 And Beyond

James Hunt profiles some of the best releases you might have missed



that were released last year, we've put together this list of 2014's best indie and low-profile titles.

Five Nights At Freddy's

www.scottgames.com

This indie survival-horror point-and-click game puts you in the role of security guard at the fictional pizza restaurant Freddy Fazbear's Pizza. Throughout the night, you must defend yourself from malfunctioning animatronic characters by tracking their movements on security cameras. A combination of simple mechanics and a creeping sense of paranoia creates a unique and powerful gaming experience that'll have your fingers twitching at the slightest movement. You can buy the game on Steam for £3.99, and if you like it, the sequel is already out with a third entry coming this year.

Shovel Knight

yachtclubgames.com/shovel-knight

If you're a fan of NES side-scrolling platformers like *Megaman* and *Duck Tales*, then *Shovel Knight* is the PC game for you. Initially released on Windows, it's also come to the 3DS, Wii, Mac and Linux, and will be hitting PlayStation 3 and 4 later this year. Featuring retro-inspired 8-bit graphics, *Shovel Knight* sees the player wielding a sharpened shovel that can attack enemies, destroy scenery and dig up treasures, upgrading capabilities as you collect a variety of power-ups. Although it might look like one for nostalgists alone, its high difficulty, fun visuals and catchy chiptune soundtrack will keep any player coming back for hours. £10.99 on Steam or £14.99 with soundtrack download.

Nidhogg

www.nidhoggame.com

Well, at least you can't accuse it of distracting your with flashy visuals. But don't let that fool you. *Nidhogg* is a swordfighting game designed for two players (though it does have a single-player mode), which pairs you up with local or online partners for a fast-paced battle where having the quickest fingers leads you to success. Your only goal is to reach the end of opponent's playing field and be eaten by the mythological Norse serpent Níðhöggr, but with a variety of obstacles in your way and a crazed opponent bent on stopping you from doing that, matches can turn on a dime. Definitely one to play with a friend (or several, in tournament mode). £10.99 on

Steam or £18.99 for two copies – one for you, one for a friend.

Broken Age, Part 1

www.brokenagegame.com

Released by Tim Schafer's DoubleFine Studios, *Broken Age* is a return to the point-and-click games of the 90s from a guy who worked on some of the best, including *Monkey Island*, *Day of the Tentacle* and *Grim Fandango*. Created following a Kickstarter campaign that unexpectedly raised around \$3.5 million – one of the most successful campaigns ever run on the site – *Broken Age* is the story of two characters from two different worlds meeting in an unexpected way as they seek to explore the outside of their well-defined lives. Visually stunning, superbly written and hugely compelling, *Broken Age* is £18.99 on Steam, which includes free access to *Part 2* when it's released later this year.

Wasteland 2

wasteland.inxile-entertainment.com

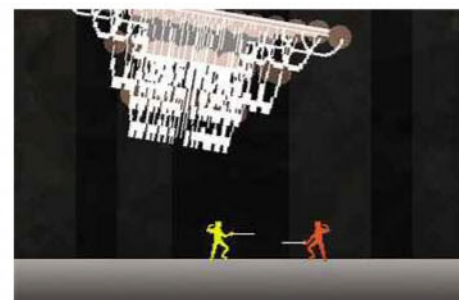
A sequel to *Wasteland*, the 1988 PC classic that was the forerunner to the popular *Fallout* series, *Wasteland 2* is a turn-based strategy RPG set in a post-



▲ *Five Nights at Freddy's*



▲ *Shovel Knight*



▲ *Nidhogg*

If you're someone who finds themselves turned off by AAA games that demand ever-more expensive high-end hardware to deliver what is, essentially, the same experience you've had a thousand times before, then you're not alone. While big-budget gaming has its place, there are only so many times you can play a game that involves running from point to point with a gun before you start to wonder if there's anything more interesting out there – and luckily, there is.

That's because the indie games scene is stronger than it's ever been, and that's reflected in the sheer volume of interesting and artistically vibrant titles that were released in 2014 – and indeed, those to come in 2015. Unfortunately, without large marketing budgets and promotional machines, it can be tough for indie games to find an audience. Not everything can be *Minecraft*. To help you track down some of the gaming gems



▲ *Wasteland 2*

apocalyptic world. Guide up to seven characters around what's left of the United States, with interactions changing based on your skills, statistics and appearance. The plot starts with a murder mystery and grows to encompass a threat bigger than any character could have predicted. With a non-linear story and multiple-solution puzzles, *Wasteland 2* is a game that allows you to truly inhabit the world you play in, with days', if not weeks', worth of content to explore. £29.99 on Steam, and an absolute must-buy for fans of *Fallout*.

Elite Dangerous

www.elitedangerous.com

The game otherwise known as *Elite IV* brings the franchise bang up to date, with an immersive, visually stunning and



▲ *Elite Dangerous*



▲ *Rogue Legacy*

action-packed return to the meticulously detailed galaxy of *Elite*. You can earn your living through piracy, bounty hunting, trading or exploring – if not a little of all four – and what you do with your money is up to you. The online connectivity places you alongside numerous real individuals (if you opt into it), which creates an unpredictable and exciting experience. It's got everything you loved about the original *Elite* and so much more. £39.99 from the official *Elite* store, with a major (free) update planned for February.

Gods Will Be Watching

www.godswillbewatching.com

A minimalist narrative-based thriller, *Gods Will Be Watching* places you at the head of a group of rebels forced to



▲ *Gods Will Be Watching*

survive through careful management of your companions and resources. Players require a steady hand, careful observation skills and a willingness to risk it all in order to come out on top. At the end of each section, you can compare your successes and failures to those of every other player, and the end of the game you'll face judgement for your choices. £6.99 on Steam, and there's a free browser-based prototype of the game available on the website if you want to try it out.

Rogue Legacy

www.roguelegacy.com

If you're a fan of roguelike randomly generated platformers like *Spelunky*, you'll love *Rogue Legacy*, which not only applies the idea to its levels but your main character as well. Taking control of a family line, you guide the hero of each generation into a castle of strange secrets and enemies, fighting bosses and collecting treasure so that you can bequeath weaponry and magic onto future generations. As you pass on your skills and possessions, nature also introduces genetic mutations that can help or hinder your quest. £10.99 on Steam.

The Fall

www.overthemoongames.com

A side-scrolling action-adventure game, *The Fall* is the opening chapter of an episodic series in which you control ARID, a combat-suit AI, which is forced to take over when its pilot falls unconscious into a derelict facility. Traversing a dark landscape, solving puzzles and fighting off enemies, you utilise your flashlight, weaponry and inventory system to find

▲ *The Fall*▲ *NaissanceE*

your way out, interacting with characters and items in unique ways while trying to survive. Surprisingly captivating story and atmospheric visuals turn what could've been a conventional *Metroid*-style platformer into something special. £6.99 on Steam.

NaissanceE

www.naissancee.com

A first-person exploration game by developer Limasse Five, *NaissanceE* begins with you escaping one problem only to find yourself in the midst of another: how to get out of the place you escaped to. Stark and minimalist storytelling combine with unsettling brutalist architecture as you search for a way out, with a whispering soundtrack hinting at danger that may never arrive. Although you catch glimpses of a society around you, you're kept constantly apart from it. *NaissanceE* may be the loneliest a computer game has ever made you feel. Deviously original and unsettling, *NaissanceE* is like *Mirror's Edge* meets MC Escher. £12.99 on Steam.

And if that's not enough to keep you going, check out our 'Future Hits' boxout for the indie games worth watching for in 2015. Remember, indie developers live and die by the sales they get, so if you want to see original, interesting and intelligent titles like this more than another Call of Shooty game, the best way to vote is with your wallet. Tell 'em we sent you. **mm**

Future Hits

Indie game release schedules are notoriously unpredictable, but that doesn't mean we can't be optimistic. If you're looking for the indie darlings of tomorrow, look no further:

The Witness the-witness.net

Sometimes it feels like *The Witness* is destined to do nothing but appear on preview lists for the rest of its life, but Jonathan Blow's follow-up to *Braid* has been in active development for years now, and recent appearances at game shows suggest that 2015 will be the year it hits the digital shelves.

But what's the game actually about? That's less obvious. Even those who've played it find it hard to describe. We can say for certain that it's a puzzle-adventure game that you play in first-person mode, set on an island full of structures (both natural and man-made), which have puzzles attached to them. If that sounds vague to you, that's probably fair. We're not quite sure what to expect ourselves, but based on the screenshots and the sublime gaming experience that was *Braid*, we can't help but be very excited to play *The Witness*.

Hotline Miami 2: Wrong Number www.devolverdigital.com

The sequel to the indie smash hit *Hotline Miami*, *Hotline Miami 2* expands the story of the pulse-pounding top-down beat/shoot/murder-'em-up while retaining the trance-like experience that made it so unique. The sequel focuses on the aftermath of the events of the first game as Jacket's killing spree inspires a wave of vigilantism and copycat murderers who want to take the law into their own hands. New features include a hard-mode where enemies are more difficult to kill, and new abilities include dual-wielding, roll evasion and the ability to control two players at once on a single mouse. It promises to be gory, intense and absolutely great fun.

Thimbleweed Park thimbleweedpark.com

If a new point-and-click games from Tim Schafer wasn't enough to excite you, how about one from Ron Gilbert himself? The much-loved creator of *Monkey Island* and *Maniac Mansion* is returning to the genre that made his

name with *Thimbleweed Park*, a retro-inspired adventure game in the spirit of his past successes, but with an all-new story and huge cast of playable characters. Funded through Kickstarter (because what isn't these days?), it's actually due for release in 2016, but there's still time to help fund the game now and get access to exclusives that will be unavailable on release.

Superhot superhotgame.com

Let it never be said that indie game snobs automatically hate any FPS that involves shooting. To prove it, we're definitely on the side of *Superhot*, an FPS where time only advances when you move your character. An action game without the twitchy reaction times, *Superhot* is part-puzzler, part-shooter and looks all-amazing. You can play the prototype demo at **superhotgame.com** now, as well as pre-order the full version ahead of its confirmed June release.

Mighty No. 9 www.mightyno9.com

If you really do like *Megaman*-style games, then this is the one that's going to do it for you. Developed by Keiji Inafune, the creator of *Megaman*, and his new company, Comcept, *Mighty No. 9* puts you in control of Beck, a transforming cyborg who can steal weapons and abilities from the enemies he defeats (sound familiar?). Its thoroughly modern HD visuals are completely hand-drawn, meaning this is a retro experience in feel only. Due in April this year, it's safe to say that *Mighty No. 9* will be the genre update fans have been waiting for.

Virginia variablestate.com/virginia

Developed by fledgling studio Variable State, *Virginia* promises to be an interactive drama set in a world inspired by the offbeat mysteries seen in the likes of *Twin Peaks* and the *X-Files*, in worlds which juxtapose the mundane and the incredible. With a focus on narrative over game mechanics, *Virginia* is silent except for the musical score forcing you to engage with the body language and environments in ways that most games allow you to take for granted. If you liked the thoughtful interactivity of games like *Gone Home*, *Proteus* and *Limbo*, *Virginia* might be 2015's answer to them.

Performance Laptops

If you need some powerful mobile computing with a little something extra, look no further

Laptops were once used only by travelling executives or those who wanted to be seen as having a job so important that it was required and the company they worked for could afford one.

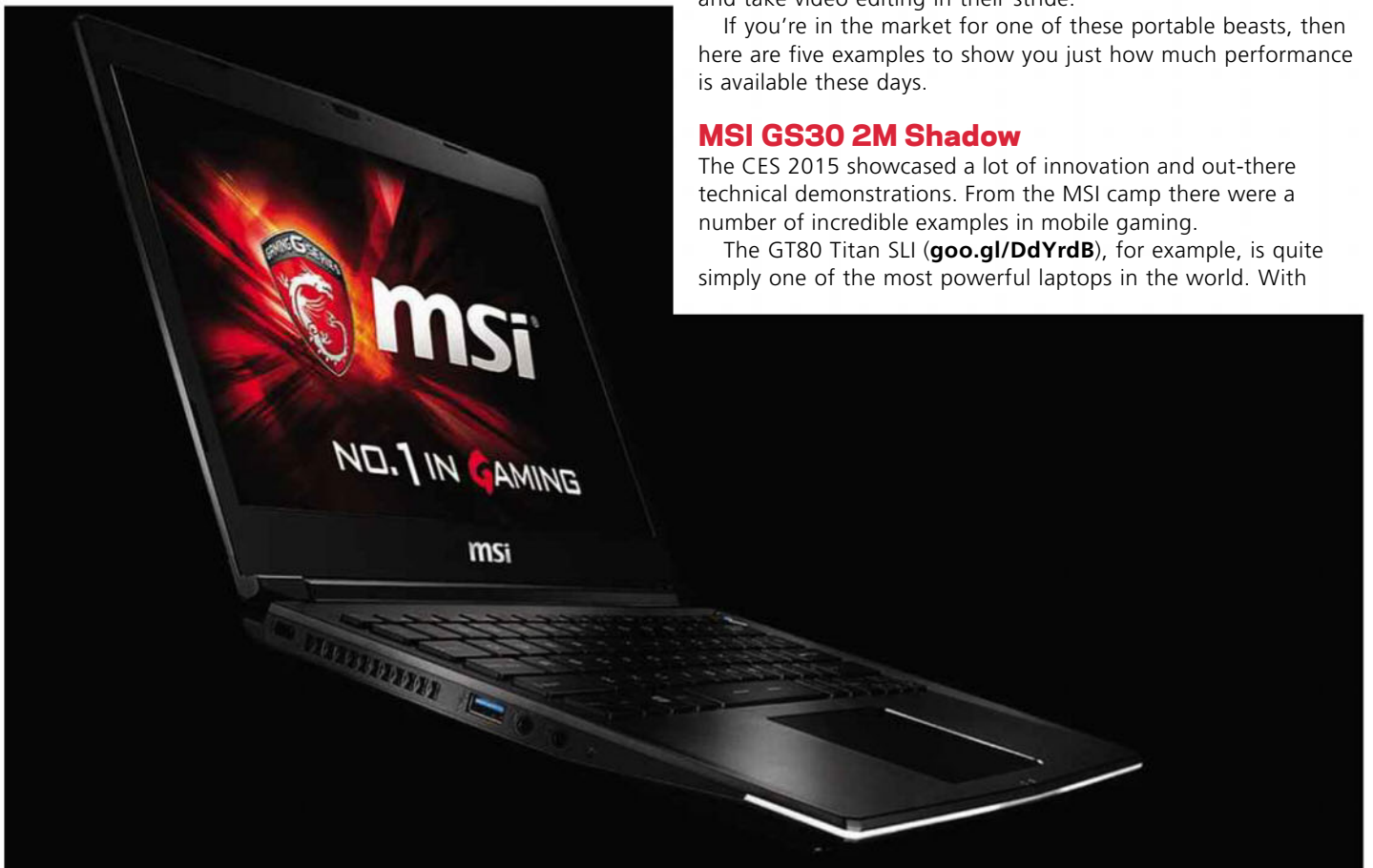
Thankfully that image has long since gone. Laptops used to be boring slabs of beige plastic, capable of little more than office work and make the odd game of Minesweeper. Nowadays, though, they're much more stylishly designed, and if you have the money, you can even get one with enough power to seriously give desktop PCs a run for their money. It's these performance laptops we're going to look at here – the type of machines that can run the latest games with smooth frame-rates and take video editing in their stride.

If you're in the market for one of these portable beasts, then here are five examples to show you just how much performance is available these days.

MSI GS30 2M Shadow

The CES 2015 showcased a lot of innovation and out-there technical demonstrations. From the MSI camp there were a number of incredible examples in mobile gaming.

The GT80 Titan SLI (goo.gl/DdYrdB), for example, is quite simply one of the most powerful laptops in the world. With



▲ The GS30 2M Shadow is an impressive looking laptop on its own



▲ The GamingDock acts as an extension to the capabilities of the Shadow. Imagine being able to do this with all the MSI range

Cherry MX Brown switches used with the integrated mechanical keyboard, dual Nvidia GTX 980M GPUs in SLI, support for four M.2 SATA SSDs in RAID 0 and 32GB of memory, this thing would prompt a nervous sweat on a £2,000 gaming desktop.

Amazing as the GT80 is, though, one of the stars of the show was the GS30 Shadow and its accompanying Gaming Dock. Billed as the ultimate in gaming ecosystems, the Shadow itself is less than an inch thick and weighs just 1.2kg.

“ Laptops used to boring slabs of beige plastic ”

It's a fourth-generation Intel Core i7 laptop, with an Intel HM87 chipset and support for up to 16GB of DDR3L 1600Mhz memory. The 13.3" FHD anti-glare screen offers an exceptional level of clarity and colour depth, driven by an Intel Iris Pro 5200 graphics chip. There's also 512GB of SuperRAID storage in the form of a pair of 256GB M.2 SSDs, set up in RAID0. Finally, a card reader, gigabit Ethernet, wi-fi, HDMI, USB 3.0 and a backlit keyboard make up the rest of the mobile element of the package.

The cherry on the icing here, however, is the inclusion of the GamingDock. The GamingDock is essentially an external PC, of a sorts, that can connect to the Shadow via a full bandwidth PCIe 3.0 x16 slot located around the back of the laptop.

The GamingDock measures 365 x 209 x 198mm and is as an ominous-looking box as you'll ever find in computing circles. The front houses a mesh grille, with the MSI lettering and the dragon logo on the front, which cover the 5W subwoofer. To each side are the speaker ports for the additional 5W speakers, as well as four USB 3.0 ports, gigabit Ethernet, line and headphone ports. The opposite end features a 450W 80 Plus Bronze-rated PSU and a back plate that can accommodate a full-sized graphics card, which fits neatly under the top of the GamingDock. (It's worth noting that an Nvidia GTX 980 Gaming 4G LE is fitted as standard, but other models, as well as a GPU-less case, will no doubt be made available soon.)

The Shadow slots into place on top of the GamingDock and is pushed into the awaiting PCIe slot. Once fitted, it's a seamless connection, with the external graphics card and other components being registered in Windows as natural, built-in

devices. With the relevant drivers in place, the whole process is handled without any fiddling about with the Device Manager of third-party software.

This is a setup made in gaming heaven, but one that does cost a princely sum. Although the exact pricing is a uncertain at present, you can expect to pay in the region of £1,500 to £2,000 for both the laptop and GamingDock. However, you are essentially getting both a gaming laptop and gaming desktop in one neat setup. For more information, check out the MSI GS30 2M Shadow page at goo.gl/4WGVKI.

Digital Storm Triton

The Digital Storm Triton is another sleek laptop filled to the brim with the latest technology. The Intel Core i7 fourth-generation CPU, Nvidia GTX970M graphics with 3GB of RAM, enhanced battery use, USB 3.0, HDMI and up to 32GB of system memory available in different configurations all make for a very interesting product.



▲ the Digital Storm Triton is a handsome looking laptop. It'll be interesting to see it arrive over here

Also Consider...

These are just a few of the many performance and gaming laptops on offer; needless to say, there are plenty more. If you're looking into a new laptop, then check out the following:

Alienware 13: Smaller than the average performance and gaming laptop, but it still packing a wallop.

Gigabyte P25X V2: A 15.6" laptop with 16GB RAM, 256GB SSD and a GTX 880M 8G GPU. Available for about £1,500.

GT72 Dominator Pro Dragon Edition: A 17.3" screen, GTX 980M 8G GPU and four SSDs make this a monster of a performance laptop.

GS60 2QE Ghost Pro 4K Gold Edition: For those of you who fancy a little more gold colouring on your ultra-powerful laptop.

At present it's not available in the UK, but it's set to reach our shores within the coming months. When it does, expect to pay around £1,100 for the base model, with prices rising to £2,000 for the more impressively packed versions.

The look of the Triton is very similar to that of the GS30. There's an almost Stealth Bomber look and feel to it, with sharpened angles and a wedge-shaped design. The aluminium body is certainly impressive too, as is the keyboard which, much like the other laptops we're looking at here, is backlit and full sized with a number pad.

The power is there for both gaming and other resource-intensive tasks. The 15" screen looks good enough for day-to-day duties, video and photo editing and, of course, you can output to anything up to a 4K monitor through the various output ports.

Whether the Triton takes to the UK market as it has in the US remains to be seen, but based on what we've experienced so far there's seems little reason to doubt it. We may even get a slightly different build from the examples that are currently available in the US. Either way, it's one to keep an eye out for. More details at goo.gl/9bCnBR.



▲ There's a familiar look and feel to an Alienware machine, but they can still stand toe to toe with the best



▲ The Alienware Graphics Amplifier is another desktop graphical extension base unit worth looking into

Alienware 17

Alienware laptops are synonymous with exceptional quality and pushing the limits of mobile technology, but they have some stiff competition these days.

The modern range of Alienware laptops consist of the Alienware 13, through 15, 17 and 18, with each indicating the size of the screen available. In this particular case, the Alienware 17 has an excellent balance of power, performance, price and size.

The Alienware 17, aside from the 17.3" FHD display, features a fourth-generation Intel Core i7 CPU, up to 16GB of memory, an Nvidia GeForce GTX 970M with 3GB of video RAM and a selection of storage options ranging from a single terabyte hard drive through to a combination of large hard drives and SSDs.

As you would expect, the Alienware 17 looks pretty spectacular. It's a design that's changed very little over the years, but it's one that's managed to stand the test of time.

In addition to the base performance of the Alienware 17 laptop, the company has also added an optional Alienware Graphics Amplifier. The Graphics Amplifier is essentially the same kind of thing as the GamingDock from MSI, in that you can fit a significantly more powerful graphics card to a base unit of sorts, complete with PSU.

The connection is via a proprietary PCIe cable, as opposed to the slot-in docking from MSI, but effectively both docking units deliver the same extra boost to graphical performance as well as including a few extra USB ports for good measure.

It set you back around £1,399 for the laptop itself and around £250 for the Graphics Amplifier. In total that's £1,649, which isn't too bad when you take into account what you're getting.

Whether the GamingDock will ultimately prove to be a better solution than the Graphics Amplifier, though, remains to be seen. It would certainly make for an interesting battle of performance.

If you're interested in the Alienware 17 and the Graphics Amplifier, details on both can be found at goo.gl/b020il and goo.gl/iCA6yq respectively.

MSI GE60 2PE Apache Pro

The MSI GE60 2PE Apache Pro offers a finely tuned balance between raw computing power and price.

Its base specification consists of a 4710HQ 2.5GHz (3.4GHz boost) fourth-generation Core i7, a 15.6" full HD anti-glare LCD, a 720p webcam, SD card reader, Blu-ray drive and 12GB of dual-channel DDR3 RAM. However, the icing on the cake is the relatively newly released Nvidia GTX 860M GPU with 2GB of GDDR5. This is an exceptional and very capable mobile graphics processor, one that's designed for extreme performance without the heavy impact on the battery, and there's also an Intel HD4600 installed for more traditional desktop-related processing. And if that little lot wasn't enough to tantalise you, then perhaps the 128GB Hynix SSD and 1TB HGST Travelstar will.

You also get the usual array of HDMI (with support for up to 4K displays), card reader, S/PDIF 7.1 surround sound, wi-fi, Bluetooth 4.0 and four USB ports – of which two are USB 3.0. In short, there's enough connectivity to keep most users happy and plenty of ways to expand.

The laptop itself is very attractive. The black aluminium lid, complete with MSI Gaming Series badge and logo, opens up to reveal the excellent screen and colourful backlit full-sized keyboard with numerical pad. MSI has heaped plenty of design elements in here to keep both the gamer and serious computer user satisfied. The keyboard, for example, may well be more

“ One way or another, we’re spoiled for choice when it comes to high performing laptops these days ”

gaming-centric than the standard affair, but it also has a good feel to it, with adequately spaced keys and a good tactile touch.

Of course, if gaming is something you’re interested in, then the GE60 2PE is certainly an excellent weapon of choice. On its own it’s more powerful than the GS30 2M Shadow (before it’s docked, that is), so it’s already very capable of playing the higher-end games that are currently available.

There’s no doubt that this is a laptop brimming with gaming technologies, and with 3DMark scores of 3756 for Fire Strike, it’s considerably better than the usual gaming laptop breed. But the gaming side of things isn’t this laptop’s only advantage. The performance of the components means that this is more than capable of dealing with video editing, photo editing and all other heavy duty desktop work, while still being economical in terms of battery use. Plus the incorporated Sound Blaster Cinema audio makes this an excellent choice for music editing and mixing.

Overall, this is a great performing laptop, which can be had for around £1,100, depending on where you shop. For more info on the MSI GE60 2PE Apache Pro, including detailed specifications, the product page can be found at goo.gl/umDhQG.

Schenker XMG C504

Schenker isn’t the first laptop manufacturer that springs to mind when you’re considering buying a new unit. Surprisingly, though, the company’s products are really quite good.

Take the XMG C504, for example. This is one of its mid-range performance laptops, which is labelled under the gaming section. It utilises the power-friendly, but still competitive, latest Nvidia GeForce technologies inside a reasonable 15.6” IPS full HD screen.



▲ The GE60 2PE Apache Pro doesn’t need a dock to make it extra powerful

The base laptop specs are interesting too. There’s a fourth-generation Intel Core i7 4710HQ quad-core 2.5GHz processor, 4GB of 1600MHz DDR3 RAM (up to a maximum of 16GB) and Intel HD4600 graphics together with either an Nvidia GeForce GTX 860M 4GB GDDR5 or a shiny new GTX 870M with 6GB GDDR5 video memory.

You’ll also find a six-in-one card reader, HDMI, mini-DisplayPort, VGA, S/PDIF out, and four USB ports (of which two are USB 3.0). There’s a full sized, auto-adjusting backlit keyboard, with number pad and a good sized touchpad capable of multi-gestures.

Schenker has managed to squeeze this little lot into a chassis that’s just 21mm thick and weighing around 2.1kg. So while you may not be getting the 17” screen beautification you’d find on some of the more striking examples of performance laptop, you’re getting something that can pack a decent punch while still being portable.

The combination of these specifications are roughly the same as some of the examples we have here, which naturally means you’ll be getting a machine that can run the likes of **Elite: Dangerous** in all of its glory, among other notable and recent titles – not to mention the ability to transcode video at a rate of knots and manipulate high-quality images with ease. In short, this is a capable laptop that can accommodate most power users’ needs.

It’s also not a bad price either. The base model, with the aforementioned specification comes in at £1,075, which makes it the cheapest in our collection of performance laptops. However, where the XMG C504 performs well enough, it’s not the most attractive laptop you’re going to come across.

Of course, the looks of the machine aren’t everyone’s major concern, and they shouldn’t be either. Who cares what it looks like, provided it can deliver the goods, right? Mostly yes. But consider that for a few pounds more, the likes of the Apache Pro provide some rather stunning elegance as well as blistering performance. In many ways, as long as the laptop doesn’t look like something from 15 years ago, complete with a toilet-coloured chassis, then we can forgive the lack of sleek lines.

The choice is up to you, obviously, but it’s worth taking a moment to sample a unit before committing to parting with your hard-earned cash.

More info on the Schenker XMG C504 can be found at goo.gl/APn5RG. [mm](#)



▲ Schenker is the most well known brand, but it has some decent laptops, which are definitely worth checking out



Network TV & Net Neutrality

Mark Pickavance looks at how the landscape of broadcast TV is being radically changed, even if many in this industry deny it's happening

Christmas is long behind us, but over the festive people, anyone older than 50 years will probably have been thinking back to a bygone golden era of British TV. In the 1970s, Christmas meant a communal TV experience, where viewing audiences ran into many tens of millions for a selection of festive TV treats.

Almost everyone with a TV watched the Morecombe & Wise Christmas show, and the annual showing of *The Great Escape* usually nabbed a substantial audience.

At the time, it was difficult to imagine how Christmas would be different and how our relationship with TV would change. But it has, and the changes we've seen since then are likely to be dwarfed by those that are coming.

The Era Of Network TV

I'm not old enough to remember the original BBC broadcasts, but they went out to less than 1,000 TV sets. Shortly

after they began, Adolf Hitler had them unceremoniously curtailed, the blighter.

TV didn't come back to this country until 1946, and we didn't get a second channel (ITV) until 1955. While ITV was eventually joined by Channel 4 and 5, the BBC was the dominant force in British TV broadcasting until Rupert Murdoch's Sky network arrived in 1989 with its extensive satellite service.

The British public went from a handful of channels with relatively little on to hundreds, and the balance of power began to shift away from the traditional TV portals.

In terms of funding, the BBC had the licence fee to spend on its shows, whereas the commercial networks used TV advertising for revenue. While the BBC's motivation always seemed less predictable, the commercial networks needed high viewing figures to justify their high advertising rates. They commissioned

shows with a wide demographic appeal and promoted certain times and days for specific viewer engagement.

USA TV networks were much less orientated towards public service broadcasting, and there was massive advertising, product placement and sponsorship from the outset.

How much they got for an ad-break was entirely based on the viewing numbers, supplied by viewing analysts Nielsen. Shows that underperformed were soon axed, even in mid-season.

Famously, some shows never actually made it to a second episode because the networks could be so utterly ruthless. Even seminal classics like the original *Star Trek* were axed when they failed to deliver the millions of viewers the networks demanded for 'prime time' broadcast slots.

Episodes were made and never broadcast, the characters on shows disappeared without reference, and actors



▲ One of these is a feral wild dog found mostly in Australia, and the other is Tom Wheeler who lobbied Congress for the US cable companies and now runs the FCC oversight of those businesses. Sorry it isn't obvious which is which

changed seemingly without those around them noticing. If Hollywood was la-la land, TV world was freakishly surreal.

Such was the power of the networks that entirely surreal things happened, like the infamous Bobby Ewing shower sequence in *Dallas*.

To recap: in the season eight finale of this show a main character, Bobby, played by actor Patrick Duffy is hit by a car and subsequently dies of his injuries.

A year later in the final episode of season nine, his ex-wife Pam, now remarried, wakes and walks into the bathroom to discover her previously dead ex-husband having a shower. The explanation, only presented in season ten, was that the whole of season nine (and bits of season eight) was a dream that Pam had. Even more bizarre, *Dallas* had a spin-off series called *Knots Landing*, where these events weren't undone, and Bobby was still officially dead when that show ended years later.

The networks' disdain for their viewers and those who created the shows was legend, and they entirely dictated the

direction that broadcast TV took until the arrival of the specialist cable channels, like HBO and Showtime.

These, along with sporting sources like ESPN, drove the concept of a whole

“ But while the range of content increased with the explosion of cable services, and in many respects better served the audience, it wasn't all good news ”

new income model, where the audience would pay specifically for shows they wanted to see. These shows generally weren't segmented with advertising and didn't adhere to rules about sex and violence that severely limited network broadcasters.

In what might be described as the second era of network TV, it was the cable networks that became the new powerbase, and the traditional TV networks became less influential.

NBC (NBCUniversal) was bought by cable operation Comcast in 2009, ABC is now owned by Disney, and CBS is controlled by National Amusements, which also owns Viacom and Paramount.

But while the range of content increased with the explosion of cable services, and in many respects better served the audience, it wasn't all good news.

Unleash The Dingo

Due to the geographical scale of the United States, outside of major cities there isn't much broadcast TV to talk about. If you want a good selection of stations, then there is only one choice: cable TV.

And when I said 'only one choice', I wasn't kidding, because the way that cable companies operate in that country is

to essentially divide up the population like a cake, where they all get one enormous slice. By not competing with each other, they avoid any silly price cutting malarkey and present most of the population with a Hobson's choice of cable TV providers.

Statistically, the numbers are that 96% of US cable TV companies have a choice of two providers or less, demonstrating that competition in that sector doesn't practically exist.

Unsurprisingly, this has led to cost rises in excess of inflation, dire customer services and massive lobbying of the US political system by those involved to make sure this golden goose keeps on laying.

Those thinking that I'm over-egging that connection need to realise that Thomas Wheeler, current chairman of the FCC (Federal Communications Commission) was prior to this role a lobbyist for the cable and wireless industry, and was president of the National Cable & Telecommunications Association (NCTA) and CEO of the Cellular Telecommunications & Internet Association (CTIA).

Most Americans were gloriously unaware of this, until British comedian John Oliver did an excellent expose on net neutrality on his US show and described Wheeler as like a 'dingo'. As in, 'Needing a babysitter, and hiring a dingo'.

Tom Wheeler has since stated for the record in Congress that 'I am not a dingo', but the impression is that those in the business of shafting the American consumer have their own predatory quadruped in this particular hen-house.

Supporting that analysis are proposals by the FCC that would create a two-tier internet, where US cable companies



▲ Brian L Roberts, CEO of ISP Comcast Corporation. Brian is a keen golfer. Just ask President Obama who he often plays against



▲ Nielsen is the company that determines who watches TV in America, and in 2010 it said, "There's no question that marketers and researchers will be eagerly watching this demographic to see whether their viewing habits change over time, but for now the idea of a cord-cutting revolution appears to be purely fiction"



▲ *Orange is the new Black* is a show that's made by Netflix for exclusive screening online. As streaming service providers commission shows, the balance of power in the TV sector is shifting

like Comcast and Verizon would be able to bill the likes of Netflix and Amazon for delivering their content fast (i.e. watchable), and everyone else who didn't or wouldn't pay would end up in a digital slow lane.

This breaks a basic tenant of the internet since its inception, and goes to the very heart of Net neutrality.

Net Neutrality

For those reading this who from the outset wondered what it had to do with computers, your perseverance is at last to be rewarded.

How the future of network TV across the world is tied to net neutrality is yet another disheartening story of the bad things that big companies do when their existing business model is threatened.

What's first critical to understand is what net neutrality is, because most of the public is generally under the delusion that it has to do with who runs the internet. It isn't. It's about George Orwell's classic 1945 allegorical novel *Animal Farm*. Please stick with me; it will all make sense eventually, I promise.

In *Animal Farm*, Orwell represented the rise of the Soviet system in Russia using the establishment of independence by farm animals. Initially the idea of a society where the elite (the farmer) no

longer controls the lower order was enthusiastically greeted by the abused majority. They write a series of slogans on the barn, among them the critical commandment "All animals are equal."

However, the greed of some animals – unsurprisingly the pigs – causes them to adjust the status quo in their favour. The commandment is eventually rewritten in protest as, "All animals are equal, but some animals are more equal than others."

Orwell was pointing out in his fable, if it was really needed, that the Russian people had essentially swapped the Tsar for Stalin and weren't actually any better off than they had been. Its Vladimir Putin's favourite book, I'm sure.

The idea of net neutrality is the communist ideal in my story, where all data packets are created equally. Therefore, when I go to access a website or a streamed TV service, the data I get or send is treated the same as my neighbour's, who is Skyping a relative on the other side of the world.

While I'm not a massive socialist politically, that seems a fair solution.

Even if it might fit most consumer ideals, those who control the bandwidth don't care for it at all. In their perfect world, they would like to (and do) throttle the streams of companies they consider

to be competing with, for a business advantage.

This is one of the critical reasons that net neutrality matters, because without it bandwidth will become the weapon of choice for the cable networks to stifle their competitors, however big or small.

If you think this wouldn't happen, then you need to consider what happened to Netflix recently when it was negotiating with Comcast to traverse its network.

Magically, as the talks went on, the speed of Netflix for Comcast customers declined markedly, only to jump back to previous levels when the deal was done. So blatant was this action that many in the communication industry warned that should this sort of 'shakedown' be allowed to continue, it would effectively ruin it as a content marketplace.

Those who think this is an American problem should look at how BT is expanding into TV and now mobile services in this country. As some point, it will control both the means of delivery through the internet backbones, and it will also be providing services over that system. If there is a bandwidth shortfall, will it share the pain evenly or direct most of that to those who aren't directly its customers?

What the ISPs are doing is working both ends of the deal, where they charge the broadband/cable customers for a high

speed link and then charge the content providers when those already paying customers use it.

So desperate are the ISPs to remodel the internet to their business plans that Verizon actually sued the US government to get legislation changes, opening up the door to killing net neutrality.

And its major competitor Comcast spent more than \$18m in lobbying Capitol Hill in 2013, seconded only by weapon systems maker Northrop Grumman in its splashing of cash.

Another dimension to this is that while all of this is going on, the TV networks have been denying for some time that any problem exists with the current business model for TV distribution.

In Denial

When US TV viewing audiences started to decline originally in the 1980s, the argument was made that the people weren't watching less, they just had more channels to divide their viewing habit over. But this wasn't the case, and however the networks sliced and diced

the numbers, new shows never seemed to get the collective audience the older ones once did.

Those in TV advertising also made the interesting assertion that while fragmented, these audiences were actually more valuable for advertisers. How? Well,

“As recently as 2010, Nielsen described the idea of cord cutting as a “busted myth”, for which there was no validating data”

if you've a fishing channel and 1,000 people are watching it, then a good number of those are likely customers for those who sell fishing equipment. It's the notion of focused selling, and the economics are better for those wishing to only reach their core audience.

Ironically, this has led to the rate of price growth for advertising to increase at an even greater speed than viewing audiences have declined. Advertisers get less for their money, then pass it on to the consumer in their pricing, and the world turns.

Another curio of the viewing decline was how those who track these statistics denied the existence of 'cord cutting' as it was described. The term refers to those people who decided to live without TV and decided either not to replace them or buy one in the first place. But it's also

a title adhered to those who watch very selectively or not through conventional methods (e.g. online).

Logically, if fewer people are watching,

then presumably some of them cut the cord? No, that's ridiculous. According to viewing statistics company Nielsen, they didn't do that and saying so is preposterous. As recently as 2010, Nielsen described the idea of cord cutting as a “busted myth”, for which there was no validating data. The snag to that assertion was that Nielsen wasn't actually assessing how much online viewing was going on, as it deemed this information too challenging to obtain.

That's very odd, because it's all digital and internet connected, so obtaining

➤ *Ripper Street, a show that once belonged to the BBC and is now backed by Amazon*





▲ *Veronica Mars* was a US TV show that ran for three seasons, first on UPN and then for its last season on The CW (Warner Bros). It was then cancelled and would have remained so, even though showrunner Rob Thomas penned a movie script. After it was rejected by Warners, he took the script, and with the help of lead actress Kristen Bell, he pitched a \$2m budget to be funded by Kickstarter. They actually got \$5.7 million, and the *Veronica Mars* movie was released in March of this year – demonstrating well that TV networks aren't the only way for shows to be funded, given enough enthusiastic viewer support

information about online viewing is relatively easy, especially when compared to widely tested viewing, where the technology is inherently receive-only.

A more accurate statement might be that it's difficult if you're not actually interested in finding out, and you'd like to avoid knowing. It appears Nielsen wasn't remotely interested, and fabled cord cutters were fantastical beasts written only about in works of fiction.

Not long ago, Nielsen finally accepted that perhaps there was a viewing audience out there, and maybe it should include it. What it admitted was that in the critical 18 to 49 demographic, conventional TV viewing dropped a whopping 7% year-on-year from October 2013. And 40% of households now have a subscription to streaming video services, up from 34% nine months ago.

What it didn't explain was how the subscribers went from 0% level to

34% while remaining totally mythical until now and how this news came as 'shocking' to those executives at Nielsen who spent many years intentionally ignoring it.

Historically, Nielsen also spent a good while disregarding deferred viewing on PVRs, until in 2005 it finally started to include that data. In 2006, a total of

“ And when I said ‘only one choice’, I wasn't kidding ”

15.2 million PVR households existed in the USA, and half that many in 2004. Forgetting more than ten million potential viewers could massively affect what gets cancelled or renewed, but until viewing numbers got very silly indeed they were never counted.

On the basis of the viewing figures that most prime time US shows can reasonably expect these days, 20 years

ago they would have all been cancelled mid-season.

Don't for one minute think that here in the UK things are any better, because instead of Nielsen we have BARB, which uses a 'tried and tested' technology almost unchanged from John Logie Baird's day. According to BARB, our statistics are culled from 5,100 British homes where 12,000 people live.

That's a sample base of one in 5,600 of the population.

According to its website, it apparently has software on

computers in 20% of the panel homes (about 1,000), but it hasn't yet added tablet and smartphone use, watching away from the home, piracy or pub viewing.

The big similarity is that both BARB and Nielsen feel their future is entirely based on pleasing existing network TV players, and BARB is owned by BBC, ITV, Channel 4, Channel 5, BSkyB and the IPA (Institute of Practitioners in Advertising).

Therefore it would be unexpected for it to release a report any time soon saying that conventional linear TV is on the rocks, and its paymasters are those in the firing line.

The Future Starts Here

Predicting where the future lies is a foolish exercise, but it's already obvious that it won't be where we are now, with network TV doing all the firing and hiring. In fact, what's really amazing about this, especially in the US, is how they're being elbowed aside by more agile service providers. Amazon and Netflix are the shock troops of this rebellion and have recently crossed the Rubicon from being purely streamed content distributors to production catalysts.

Netflix has had much success with shows like *Orange is the New Black*, and just recently Amazon commissioned *Ripper Street*'s third season.

That last production is very interesting, not least because it was originally a show that the BBC commissioned for two seasons, but which it decided it didn't want to fund for a third. This despite it being voted the best show of 2013 in a poll the BBC's own Radio Times TV guide and magazine ran.

In stepped Amazon Prime (formerly known as LOVEFiLM) and backed the production, and it sold on second screening rights to the BBC. This could well become a model for future shows, where the wider distribution model offered by streaming services makes them more affordable and therefore more likely to be made.

The greater problem is where this leaves the likes of the BBC, which doesn't have a remit to become a global Fox/News Corp conglomerate. Most viewers want to choose their content and not have a publicly funded corporation simply repackage it for a hefty annual fee. What the savvy viewer is ultimately looking for is an entirely tailored service where you can watch only what you want and pay only for that.

On that basis, the BBC doesn't actually have a future, unless we're looking to pay for a mandatory service that charges us for its global branding exercise. And if we really want someone to pick our TV, we can find someone cheaper and with a bigger catalogue than the BBC owns.

If it doesn't make or commission things to a wider plan, then it's just another streamed service provider – and one with a horrible track record of not understanding big IT infrastructure projects.

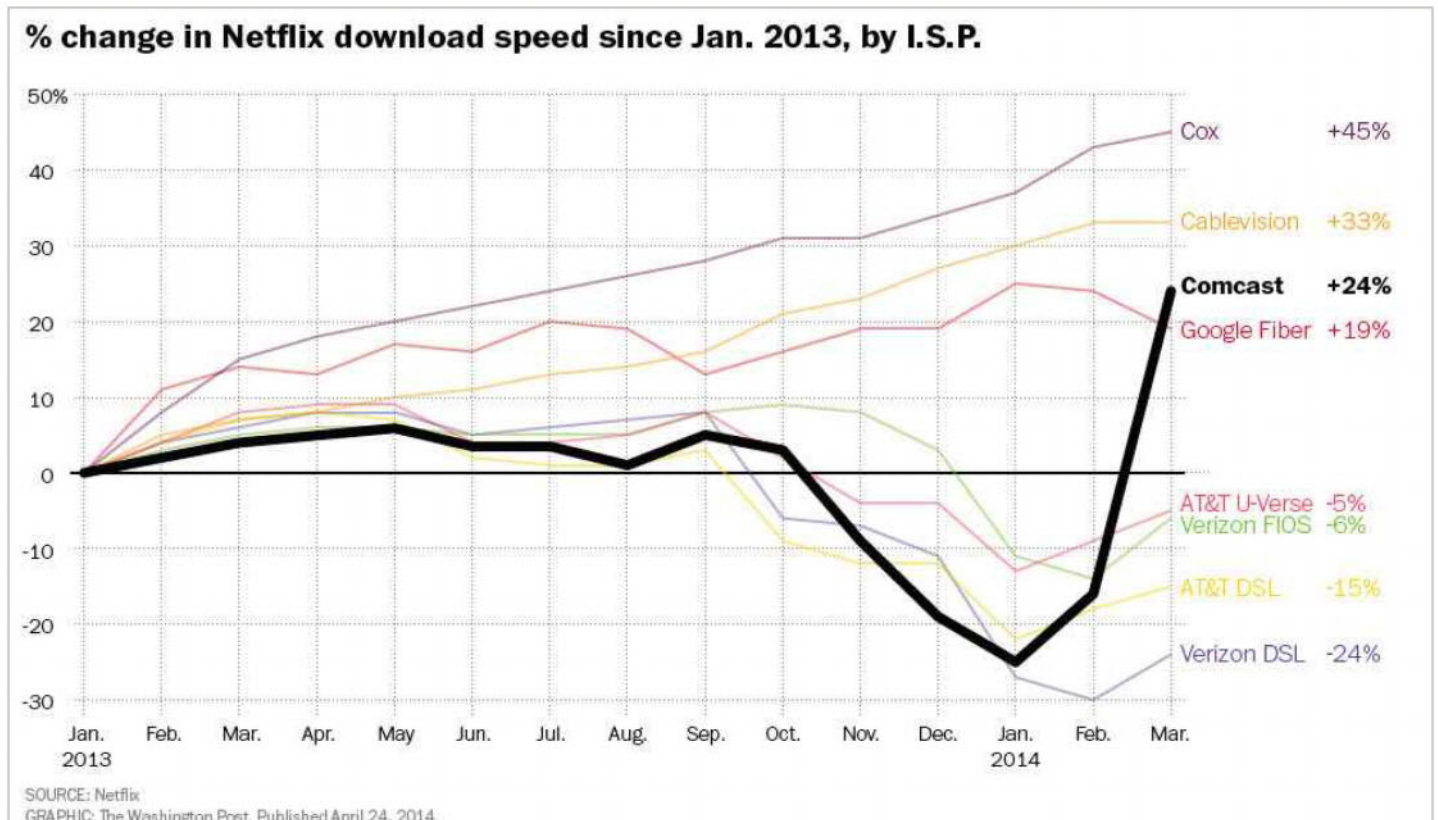
In the meantime, those that control the internet backbones are looking to milk the content streaming business by abolishing net neutrality and probably bring their own associated content businesses online once the market has matured.

A potential merger between two of the largest US ISPs, Comcast and Time Warner, is already ringing alarm bells, being that one of them is already a major player in content creation and online gaming.

The similarities between this and what happened to the film industry after WWII are striking. The big Hollywood businesses, like Warner Brothers, engaged in a vertical market where they not only owned the film stars but the studios, the production facilities, the distributors and the cinema chains. This wasn't good for choice, quality or pricing, and ultimately legislation was enacted to break up these companies.

As for the bigger picture of TV viewing, many in the US are waiting for Nielsen to explain how cord cutting is now real and not a myth, and why they've been encouraging US TV networks to cancel shows with a healthy audience for years through tactical misinformation.

So far, that news story hasn't appeared on any TV – yet. [mm](#)



▲ This is a graph covering the period when US ISP Comcast and NetFlix were negotiating. Can you guess when the discussions started, and when they ended?



Music Apps For iOS

**Want to go beyond the walled garden of iTunes?
There's a surprising amount of scope, as Keir
Thomas explains with a look at five cool apps**

Apple might have cornered the market with iTunes in the digital music arena, but there are many other options and services, including several that are offered within the App Store. This week we take a look at a handful.

As always, the apps reviewed below are tested on a Retina iPad and, thanks to Vodafone's largesse (across a painful 24-month price plan), we now also test apps on an iPhone 6 Plus. This allows us to note if any apps haven't been updated for the larger screen.

It's important to remember how iOS works when considering many apps below. Although an app might let you download tracks, you won't be able to subsequently import them into iTunes or grab them off the device, because of iOS's sandboxing approach. However, the good news is that all the apps below continue playing when you switch out of them, and you can subsequently control them via the transport controls in Control Center.

Free Music Download - MP3 Downloader And Player

This app has such a long title that it doesn't actually fit in the App Store description field. It's only via a web search we found out its actual name. However, within the iOS launcher, once installed the app appears as Music D/L, so we'll use that title here.

Music D/L is faintly reminiscent of the good old days of Napster and is one of those apps that makes you wonder about legality. It offers free access – both downloading and streaming – to the iTunes Top 100, as well as swathes of music in other major categories.

However, a unique feature of the App Store is that all apps are personally vetted by Apple employees against an often ridiculously strict set of guidelines. Legality is, of course, one of them. If Music D/L were breaking the law, then it simply wouldn't be available.

Our best guess is that the music is stripped from various free online music websites and services, like SoundCloud. This might

contravene the services' usage guidelines, but that's not an issue for end users of this app to be concerned about. We also suspect (but can't prove) the quality might be slightly lower than an equivalent iTunes download in terms of bitrate or even sample resolution, but does this really matter? The tracks certainly sounded great to us, and we all got by on the vastly inferior cassette tapes for years without complaining too much.

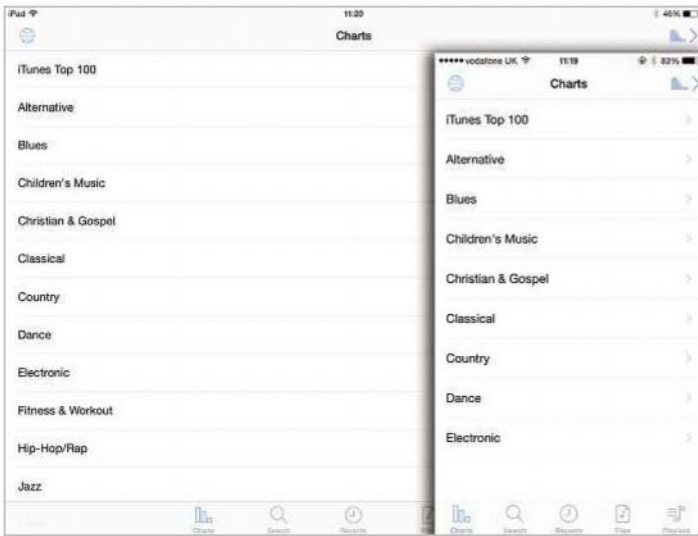
So what does the app offer? To be blunt, if you're into chart music, then you'll be in heaven. As mentioned, the iTunes Top 100 is provided. Tapping an entry shows two tabs: Stream and Download. Tapping either typically shows several choices, presumably from several different online sources, and tapping the plus icon will add the track to a playlist, while tapping the cloud icon will attempt to download it (although this isn't always successful).

Once tracks are playing, you're often shown album artwork, and the usual play controls are available (along with AirPlay mirroring if you've an Apple TV or AirPort Extreme). Along with typical playback controls, such as the ability to loop the song, there's also a graphic equaliser with several handy presets, a bar visualiser (that is, a faux LED VU display) and even a sleep timer. Tracks can be added to playlists too.

Outside of the Top 100, you can search for music in categories such as Alternative, Blues, Classical, Country and more. The app shows a US bias here – few UK users are going to be interested in Christian & Gospel, for example – but there's so much elsewhere that you won't care. There's an option to switch your country but switching to the UK showed 'No Audio Found', so it's best to stick to the US setting.

Alas, in-app adverts are aggressive and persistent, with interstitial videos that can't be skipped and a banner ad is visible at all times at the bottom of the screen. It also appears you're limited to a maximum of 50 downloaded tracks. A Pro version of the app is available for £2.99.

However, to be honest, we simply don't care about ads. This is a great little app for teenyboppers who don't want to (or can't)



▲ **Free Music Download – Mp3 Downloader and Player** might look dull, but it quite literally offers something for nothing and is highly recommended

spend 99p per track or who don't want to be forced into data-plan-decimating streaming.

Spotify

Ridiculous licensing restrictions mean what we Brits use for streaming varies tremendously from what other countries might use. While Spotify is available everywhere, in the UK it's perhaps the king of the streaming pile, having established itself early on. It provides a high water line of quality that other services aim for.

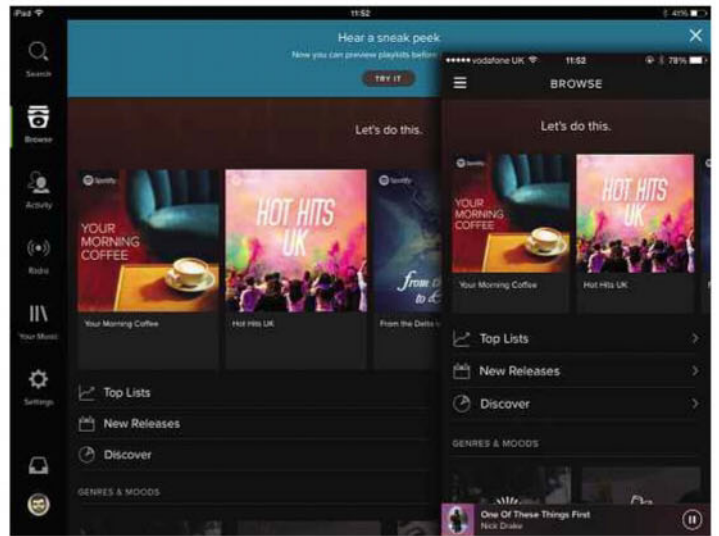
However, that increasing competition means you can now use Spotify for free on your mobile device without paying the somewhat stiff £9.99 monthly subscription fee. Alas, there are some limitations, the chief one being you're limited to streaming and not downloading. In other words, you'll need an internet connection at all times to use Spotify (you did take out an unlimited data plan, didn't you?). There are

“ Who would be an app developer? You create a clever app, and then somebody comes along and clones it ”

also adverts inserted between tracks and a limit in the number of tracks you can play. It's claimed sound quality is also better if you hand over a tenner a month ('high definition'), but everything again sounded great to our admittedly non-audiophile ears. The final limitation is that on the free version you can only create or use playlists. You can't just look up a song and start playing it.

In other words, Spotify subtly puts barriers in your way that might encourage you to upgrade, but there's still a useful service underneath. This is how free services should function, in our opinion. In any case, you can sometimes watch videos to get 30 minutes of ad-free music.

On both the iPad and iPhone, the app opens to the Browse screen, headed by the bold statement 'Let's do this.' Beneath, you'll find various ready-made playlists, as well as Top Lists, New Releases and Discover headings. The former two categories lead to further playlists ('Top Tracks in the UK', 'Top 100 on Spotify' etc.), while the latter is



▲ **Rightfully the king of the streaming music services (and downloads too, if you subscribe), Spotify** is simply a superb service coupled to a terrific app

an intriguing feature that claims to learn from your taste in music and suggest new tracks to you.

Also listed in the browse screen are various nebulous headings like Mood, Party, Pop, Workout, Focus, Rock and so on, and each leads to yet another selection of playlists geared towards the eponymous genres.

Creating your own playlists is a matter of finding tracks via the playlists or simply searching via artist or track name. Once you find a track you like, you can tap the menu button to add it to a playlist, or if you've paid up for Premium, you can listen to the track there and then. You can also save it to your favourites list, which is like yet another playlist.

Another key feature of the app is Radio, which lets you tune into a moderated list of tracks, the playback order of which you have no control over – just like real radio, we guess. Often artists have their own radio stations too that play only tracks by them.

The Activity feature lets you hook up with friends and even send and receive messages.

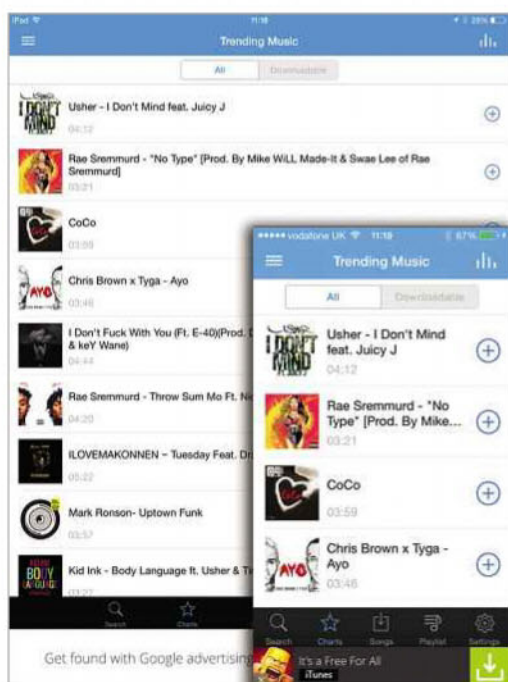
There's lots more we could say about Spotify, such as the fact it's AirPlay compatible, but put simply, this is a well-designed service that continues to evolve creatively. The app provides the near perfect experience.

SoundTube

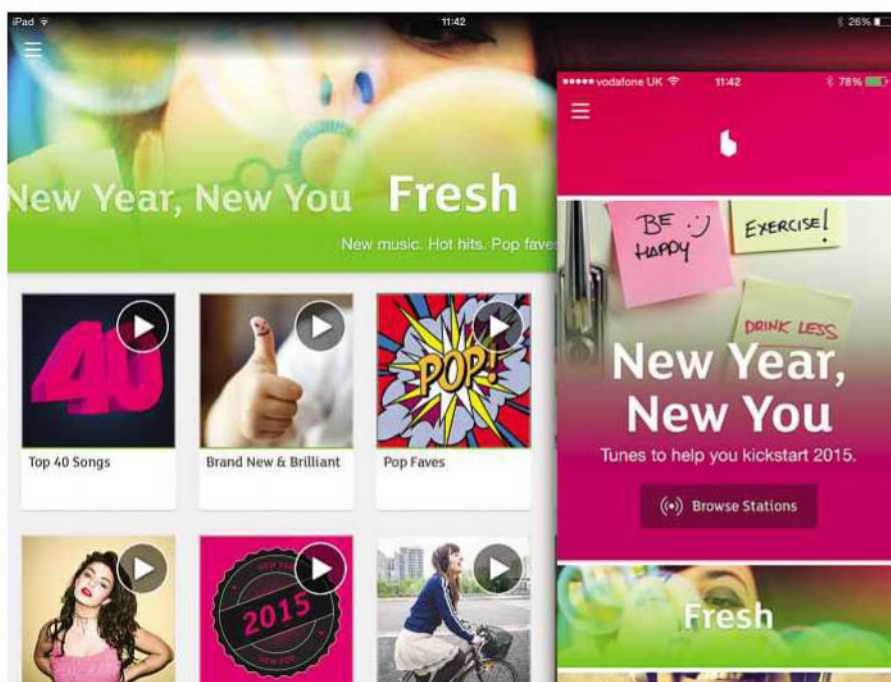
Who would be an app developer? You create a clever app, and then somebody comes along and clones it. And so it was that either the developer behind SoundTube first thought up the idea of collating free music streaming and downloading offerings or Music D/L did (reviewed above), but the two apps are certainly very similar.

Music D/L wins the battle, however. For starters, SoundTube hasn't been updated for the iPhone 6 Plus screen size. This obviously isn't an issue unless you like big screens, but it does indicate a developer who's not updating frequently. Additionally, the iPad version of the app forces you to hold your device in portrait orientation and essentially treats the iPad as a large phone. Yuk! This ain't Android, you know!

On both iPhone and iPad, the app opens to the Charts listing, and here you'll find another difference – the cheeky listing of the iTunes Top 100 in Music D/L is an excellent way to access tunes, but in SoundTube the categories are Trending Music, Trending Audio, and then the usual genres such as Ambient, Classical, Country, Dance and so on. There is a Pop genre, which is perhaps the best choice. What's more, the top



▲ **SoundTube** isn't quite as good as the virtually identical **Music D/L**, but it's useful to track down elusive music



▲ **Blinkbox Music** takes a clever approach to streaming, presenting stations that let you discover bags of new music too

charts in SoundTube tend to be very international, with Arabic songs appearing in the lists, for example.

Like Music D/L, SoundTube can both stream and download tracks, and selecting a tune usually offers a handful of sources that you can choose between. A search function lets you find artists you're interested in, and although it takes quite a while for results to appear, it did seem to work well. Suggestions appear as you type, which is a pretty neat feature, similar to that found in iTunes, and can aid the discovering of new material – typically searching for one artist will autosuggest collaborations with another artist, for example.

Maybe we had back luck, but around 50% of the tracks we attempted to download failed, with a message suggesting we retry. Rather strangely, doing so nearly always managed to download the track, and it seems one of the options you can add in by upgrading to SoundTube Pro for £2.29 is the ability to autoresume downloads. Notably, Sound Music D/L had a similar issue, making downloads as paused or showing them as perennially 'connecting'.

Additionally, in a similar way to Spotify's free offering, except this time limited to downloads, songs can't be played unless you add them to a playlist. This is a little annoying, as are the adverts that appear full screen and are a constant banner presence at the bottom of the screen – but then again these infect Music D/L too.

SoundTube feels like the less capable little brother of Music D/L, which edges ahead with a superior set of features. However, as a way of getting tunes, SoundTube is certainly worth keeping on your device for those situations where Music D/L doesn't find what you want. Hanging over £2.29 for the upgrade ain't gonna break the bank.

Note that there are many apps with the title SoundTube in the App Store. The one reviewed here was created by developer Gengdong Ma.

Blinkbox Music - Free Music Streaming

Once owned by Tesco, but not any longer following the shopping giant's recent troubles, Blinkbox was an earnest attempt to corner the UK market when it comes to music and movies. Arguably it even led to the creation of the Hudl tablet, when Tesco executives planned dominance of the online shopping world as well as real life.

As its name suggests, Blinkbox Music is all about streaming, but this is done via 'stations' – essentially readymade playlists – which themselves are organised into Collections, such as New Year New You, Feelgood, Wired, Vibe, Blast! and more. Within the categories you'll find individual stations such as Top 40 Songs, Brand New & Brilliant, Pop Faves, Next Big Thing and so on. These are curated stations created by the people at Blinkbox HQ and are not just computer generated.

This approach does mean that playing individual songs you like is

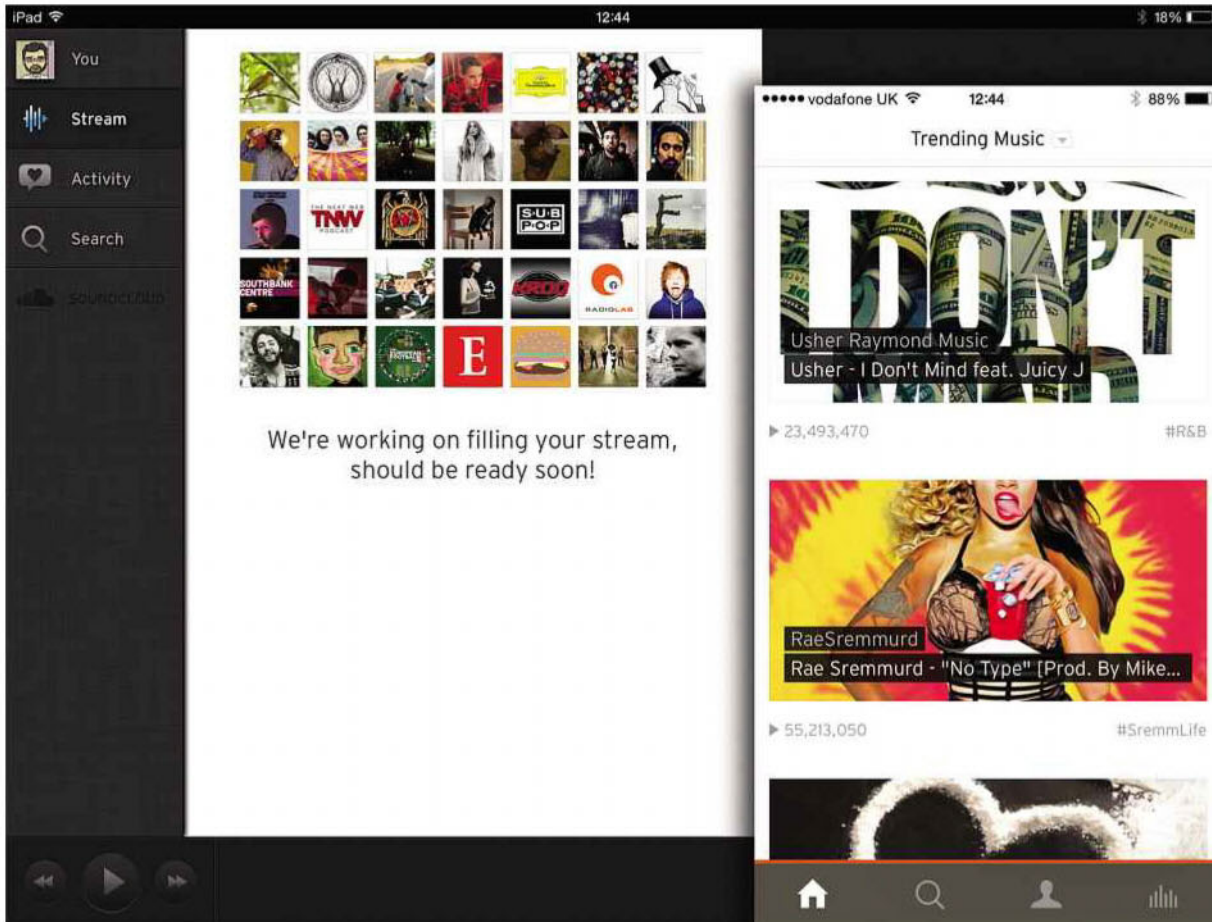
“Blinkbox was an earnest attempt to corner the UK market when it comes to music and movies”

impossible, and while the search function lets you uncover stations partially featuring tracks by your favourite artists, you can't explicitly search for music only by a particular artist. We're not sure if this restriction is actually that major, however, and searching for a Pet Shop Boys channel led to music by Bronski Beat, Yazoo, Prefab Sprout and other 80s synth pop artists. It's hard to see Pet Shop Boys fans complaining.

Perhaps surprisingly, bearing in Blinkbox Music is supposed to be a streaming service, it's also possible to download stations for offline listening. This worked well in our tests with AirPlane Mode activated.

You can also compile a 'My Station' by favouriting individual tracks. Again, this doesn't necessarily mean that tracks will appear in your My Station, but it does mean the artist probably will, as well as similar artists.

The app works equally well on iPad and iPhone, with some thought having gone into the interface on both devices. Tapping the play button alongside a Station starts it playing, in which case playback controls fill



◀ *SoundCloud is a completely different app on the iPad and is perhaps best avoided unless you need to record, but the iPhone app offers good access to new music*

the screen, and the play/pause button shows an image of that artist or the image for that particular track. By tapping the down arrow at the top right you can switch back to the station and/or category listing, in which case the track name will minimise to the bottom of the screen.

Blinkbox Music is a professional and well-designed app. It avoids cheap tricks such as forcing banner ads into its interface and manages to elegantly combine the ability to listen to your favourite music by your favourite artists with the ability to discover new material. Above all, it appears to be entirely free; there's no push for you to upgrade to a subscription and no limitations in what you can do compared to a Pro or other style of upgrade. Who knows how long this will continue in the post-Tesco landscape, but we advise you to enjoy it while you can.

SoundCloud

Perhaps best described as YouTube for audio, the SoundCloud website has been quite literally making waves since its inception in 2007 – literally making waves because a key feature of playback on its website and within its iPhone and iPad apps is a waveform display of the track in question.

Although popular with amateur artists seeking a wider audience, several successful musicians have signed up to SoundCloud too, making it a good stop-off point for those who want to explore while remaining safe in the knowledge that their favourite artists are just a tap away.

Our first impression of the app was muddled because on the iPhone we were able to get straight into playing tracks, but on the iPad we had to log in – either with an existing SoundCloud account or by creating one. It was also possible to sign in using Facebook or Google+. Once logged in, it became clear we're talking about two separate apps here, and our guess is that the iPad app is a little older. It's certainly more primitive. While the iPhone app opens to a suggestion of tracks you can listen to and lets you select from a list of categories by tapping

the menu button (Trending Music, Alternative Rock, Ambient, Classical etc.), on the iPad app you're invited to record music, and the only way to discover new tracks is to use the search function.

The iPhone app is therefore of most usefulness, and sadly it doesn't look like it's possible to force the iPad to switch to the iPhone way of working. Let's just hope an update arrives soon.

That said, although the interface on the iPhone app is thoroughly modern and makes it easier to access tracks, it isn't quite perfect. When a track is playing, the toolbar providing access to the home screen and search feature disappears, which is a bit confusing. Eventually you'll figure that swiping down brings it back, leaving the track playing in the background. There's also a Hide button at the bottom right that does the same thing. However, swiping left or right moves you to the next track in the listing – a confusing feature compounded by the fact that dragging the aforementioned waveform display lets you cut backwards and forwards and because the background image also scrolls slowly as the track plays. Simply tapping the screen pauses the track and very neatly hides the artist/tune artwork too, which somehow seems apposite.

The iPhone app also allows the ability to log into SoundCloud, as well as create a new account or logging in via Facebook or Google+. Notably, the iPhone version of SoundCloud doesn't allow you to record audio, although you're advised to download the AudioCopy app for this purpose. This is free but comes with in-app purchases. Unfortunately, checking it out was outside the scope of this group test, but the message is perhaps that uploading to SoundCloud is best done via a desktop computer.

The iPad app is a little odd, but the iPhone version of SoundCloud is pretty neat and an excellent way to explore new music – and, of course, audio in general, because SoundCloud is also about podcasts and other types of recordings. [mm](#)

Remembering...

Zip Drives

David Hayward fondly recalls a long lost form of portable storage

Back in the early to mid-90s, the sizes of PC files and folders, games and other programs were starting to expand well beyond the capabilities of the humble floppy disk. Having a copy of *Beneath a Steel Sky*, *Tie Fighter* and *Blackthorne*, along with your college work soon meant owning huge piles of floppies and made the transporting of data from one machine to the next somewhat difficult and tedious.

Then all of sudden, Iomega introduced the Zip drive. This was to be the next generation of storage, the spiritual successor to the floppy, which had already seen many decades of service.

There were other examples of much greater storage around that time, though. CDs were fast becoming the norm, and access to old IDE hard drives through a parallel port converter was also available to those who needed extra portable storage.

There was something about a Zip drive, though, that seemed better than the rest. It was sturdy, it looked like a floppy disk, and it was reasonably quick – much quicker than what we were previously used to anyway.

They were also cross platform and came in both external and internal versions. And they made excellent backup devices for aging PABX systems, as well as a decent and cheaper backup solution to tape drives.

Its History

The Zip drive was launched in 1994 and offered enormous capacities of 100MB

and upwards as the years rolled on. They were significantly better than the previous generation of portable storage in many ways, in that they were faster, could withstand more ill treatment and were generally more reliable.

Eventually, the 100MB model made room for the 250MB. These were simply crazy sizes and were actually more than the hard drives in most PCs. After that, the 750MB version was made available.

But the Zip drive was up against some stiff competition, mainly in the form of the optical drive. Whereas an early Zip disk would hold 100MB, a CD could hold 700MB right from the start. There was also a price issue that would eventually come to be the Zip drive's undoing. A 100MB Zip disk would cost around five or six pounds each, and as time marched on, the cost of producing a CD dropped so much that a single unit would set you back mere pence.

CD-RWs then made an appearance as a regular fixture in modern PCs, and the process of writing data to an optical disc became a little steadier and more reliable. Then, of course, came along the USB flash drive, and the poor old Zip drive never stood a chance.

There is a happy ending to the Zip drive, though: they're often used by retro computing enthusiasts and also as a means of backing up remote servers that don't have a decent internet connection.

The Good

Compared to the 1.44MB of a floppy disk, the sudden ability to store 100MB

was simply amazing. They were portable and they were a lot harder to break than anything previously.

The Bad

Despite their advantages, they were expensive and some models were prone to the dreaded 'Click of Death'.

Conclusion

Iomega Zip drives, you may not have lasted very long on the PC scene, but we loved you nonetheless.

Did You Know?

- The Click of Death (COD) could happen at any time, and when it did, it had the habit of destroying any other Zip disk you inserted.
- Apparently, there was a software tool available called *Trouble in Paradise*, which spun the disk so fast it overheated and purposely damaged the drive.
- You could get past the password protection by setting the device with a new password and putting it into sleep mode. Then you could use a paperclip and force eject the disk, put in a password protected disk and power the drive up to remove the password protection.
- Iomega even developed a Zip disk camera, called the ZipCam.



▲ The Iomega Zip drive – a wonderful thing it was too



▲ 100MB was just amazing. Most people thought it would never get filled



▲ The Zip setup, consisting of drive, disks, SCSI PCI card and SCSI cables

The Things That Frustrate Us About... Contactless Cards

If you have a credit or debit card that is due to be replaced soon, be prepared to get annoyed...

Banks seem to be determined to help us spend our money. We've come a long way from the days of having to go to a bank counter to get cash out. Now you not only don't have to bother much with cash, but you barely need to worry about pulling out a card either, since many new credit and debit cards use 'contactless' payment systems. What that means is that you can wave your wallet in the vague direction of the reader at a checkout and the payment will be taken automatically. No PIN entry or signatures needed. It's the future!

Except inevitably, there are problems with this system. Lots of people worry about crime, since if your wallet gets stolen, a criminal can use your card in a shop without needing to know your PIN or even forging your signature. Also, some shops have had issues with charging customers twice, as their contactless readers have read their cards when they first got to the checkout, but the cashier has conducted a PIN transaction anyway.

Some wrinkles are already being worked out, but there are still lots of annoyances to contend with...

Grrrr! Card Clash

Right, this is the big one, especially if you use public transport in London or have to use a swipe card to get into your office or home. Because contactless payment cards use the same kind of technology (it's called NFC – near field communication) as other kinds of entry cards, when you've got more than one of them in your wallet, readers can get confused, and refuse the transaction. This means you'll have to dig your card out of your wallet after all, making the whole thing a bit pointless.

Fix it: If you want to be able to use both a contactless credit card and another NFC card, sorry but you're going to have to carry them separately we're afraid. Some banks provide stickers you can attach to your phone and use to make payments; or you can just stick your Oyster card in a card holder.

Some people have gone so far as starting to use NFC guards in their wallets, to separate or block their cards from use, but that's probably more of a faff than just getting out the card you want to use in the first place.

Bah! Spending limits!

As a fraud prevention technique, contactless cards generally have low spending limits – £20, usually. So, while they're fine for buying a coffee or a paper, you can't use them for your weekly shop, because larger transactions will be declined. Boo!

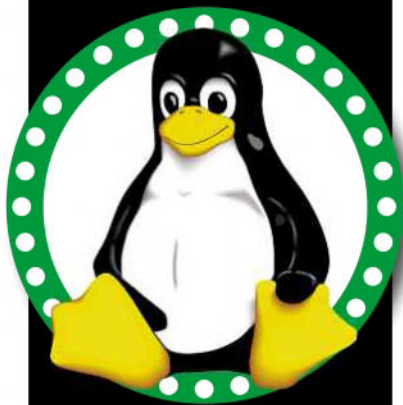
Fix it: As this annoyance is ultimately beneficial – especially if you get your bag stolen – it's best to just deal with it. Sorry.

Oops! Can't Use It Everywhere

Once you get over the initial oddness, contactless paying is quite handy. It speeds up transactions by a few seconds, and can save you rooting around in your wallet when you just want to grab a chocolate bar and go. Then you discover the newsagent can't accept them, and suddenly everything starts to seem like it takes forever.

Fix it: This is the price of progress, unfortunately. Contactless payments systems don't seem to be going away, though, and are still being rolled out – which could be good or bad news, depending on how you look at it. **mm**





David Hayward has been using Linux since Red Hat 2.0 in schools, businesses and at home, which either makes him very knowledgeable or a glutton for extreme punishment

Linux

Distros Worth Checking Out

2015 shows some promise for the distro junkie

A new year, a new distro. If I had a pound for every time I heard that statement, I could probably pay off my mortgage and have enough left for a chicken sandwich.

It's always amusing to read – usually toward the end of January – of how this year is one that Linux will expand into the desktop market to a point where it far overshadows Microsoft. I'm guilty of it myself, I admit. However, I do like trying out a new distro and dreaming of a day when everything works out of the box, so I don't have to spend frustrating hours figuring out how to get some device working properly.

That said, there are some rather interesting new and updated releases lined up for the coming year that will certainly pique the curiosity of the distro hopper and those who just like to toy around with something different.

Unity-free Ubuntu

There's a lot of love being shown for the recent release of Ubuntu MATE, primarily because it does away with the divisive Unity desktop.

It's doubtful that Canonical is too worried over this community-led build, but there are a number of users who are happy to have an Ubuntu as it used to be, rather than the way it is now.

Elementary OS

I have to say, I've never been a fan of Elementary OS. Sure it looks good, with fancy desktop graphics and all that, but at its

core it's never really worked all that well for me.

Nevertheless, there are plenty of people who do appreciate it – enough so it seems that this flavour of Linux has had a sharp rise in users over the last few months.

Either way, give it a try and draw your own conclusions.

Ubuntu Touch

Ubuntu Touch, the OS for phones that was supposed to appear in 2013 and then in 2014, is now apparently going to appear in 2015.

Does it stand even the remotest of chances, though, in this world of Android and iOS devices? Even Windows phones, which aren't all that bad, can't compete with the big two mobile operating systems, so the odds are more than slightly stacked against this two-year-old concept OS succeeding.

SteamOS

Valve's big new OS, ready to be shipped with its revolutionary Steam Boxes. To be honest, after the brief article or two on how to set up the beta version, I have quite forgotten what actually happened to SteamOS. Does anyone use it? And has anyone actually got a Steam Machine? Perhaps 2015 will bring better fortune for this forgotten OS.

Fedora

Now here's a distro that seems to be gaining ground with users of varying skill levels.

Once regarded as the more expert distro, Fedora has become more focused and with three main versions now in operation – workstation,

server and cloud – there could be more interest in the coming months.

Money For Old Rope?

Maybe I'm being a little pessimistic here, but does this seem like the same old stuff is being repackaged into a shiny new box.

Where are the revolutionary features? Where are the distros to bind everything together? And where are the desktops that get the best from the latest hardware or help bring life back to an aging setup? Weren't we promised them last year and the year before that?

The cynical among you may agree; the passionate may not. For the rest of us, let's just see what the year brings.

▼ *Ubuntu Touch: a nice idea, but will it even scratch the mobile OS surface?*



Plug And Pray

It's bizarre that in an age of continuity, Apple devices sometimes refuse to communicate at all

One of the main reasons to use Apple kit is that everything's supposed to work seamlessly together. But this has never entirely been the case. Head back quite a few years, and you may have found people trying desperately to network Macs, pointing at AppleTalk cables and yelling: "But. You. ARE! Plugged. In!"

Fast forward a couple of decades and it seems like not a lot has changed — only the specifics. My bugbear at the moment is that, for reasons known only to Apple, iTunes most of the time steadfastly refuses to believe any of my iOS devices exist, despite their literal existence rather being evidence to the contrary. Even better, my Macs regularly throw a strop when I plug the devices in.

Wireless connectivity is, to be fair, quite often a crapshoot. What we take for granted, in the sense of digital things talking to other digital things, involves behind-the-scenes shenanigans, the complexity of which would probably make your head explode on trying to understand it, unless you're an engineer, in which case you'd

just shrug and sigh in a weary manner. But iTunes is a whole other beast. While other apps will happily recognise an iOS device is on the network, iTunes will ignore it entirely, or put the device in its toolbar, to mock you, before saying it's "trying to find" what you then select. Naturally, the icon then vanishes, despite the device itself being only centimetres from the Mac.

The nuclear option is to party like it's 1999 and actually plug something in. With a cable. It feels a bit weird to connect a brand-new, shiny iPad to an iMac with a thin, white wire, but for a while, this seemed to work. iTunes would grudgingly admit the device existed, enabling me to get on with transferring content; and this also enabled other apps access to the device, such as iExplorer — handy for safeguarding and side-loading app data, such as game progress. (Apple, in its infinite wisdom, doesn't do this itself — something of a strange decision in an age of 2GB iOS games and 8–16GB iOS devices. However, that's another gripe for another column.)

But something happened recently, and now neither of my Macs seems terribly up for talking to any iOS device that's plugged into it. Instead, it asks, every single time, whether the device should "trust this computer". You tap OK, and it then hurls itself into a loop. The only solution I found for this initially wasn't really a solution at all, but the old 'turn everything off and on again' trick — a massive waste of time, not least when you're trying to work and have a dozen apps open.

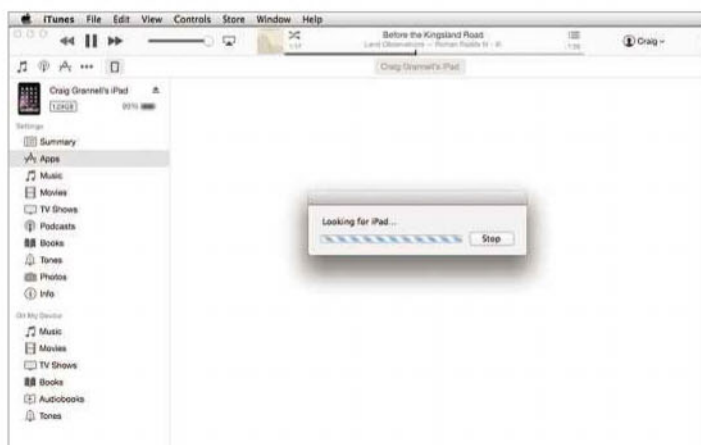
Through some deft forum searching late one evening, I found another means of dealing with this problem. First, everything connected just to iTunes needs to be closed and the relevant devices unplugged. Next, Activity Monitor should be launched and the process 'usbmuxd' force-quit. Then iTunes, iExplorer and the like can be relaunched and the device plugged in again. "It just works."

Quite why iTunes and its related daemons have ended up in such a shambolic state is anyone's guess. Maybe no one at Apple plugs iOS devices into Macs any more. Perhaps they have a version of iCloud that no one else knows about, which magically syncs any and all data, regardless of whether the app technically supports it. Whatever the case, it's hardly an Apple-like experience when you have to root about in Activity Monitor in order to get two products to work together. Trust this computer? Not really. Nor, increasingly, the company that made it.

< iTunes, as ever, performing as expected while writing this article



Craig Grannell is a writer, designer, occasional musician and permanent loudmouth. He's owned Macs since 1996, when Apple was facing certain doom, and is therefore pleasantly surprised by its current success. Find Craig on Twitter at @craiggrannell



Mac



Ian is a professional IT analyst, a semi-professional writer and a pretty amateur electronic musician. He likes gadgetry and loves making gadgets do things they were never designed to do

Mobile

Insert Coin

Ian McGurran looks at the best arcade remakes you can hold in your hands

Just before Christmas, the perfect storm of curiosity, a pretty poor console year and the lure of the Steam Christmas sale resulted in the building of my first gaming PC in some ten years. My handiwork resulted in a i5 / GTX 970 powerhouse that I duly hooked up to my 4K TV, with visions of an ultimate gaming experience. But did I end up spending hours of my time locked in high resolution battle in Mordor or being astounded by the ambient occlusion effects in Kyrat? Um... no. Instead I clocked up hours playing... *Pac-Man*. However, this was not regular *Pac-Man*, but *Pac-Man Championship DX+*, part of a recent spate of arcade remakes that add many modern bells and whistles while still offering a pure arcade experience. And what's even better about these games? Many of them are on mobile platforms too.

Pac-Man Championship DX

While it's not quite the DX+ version on consoles and PC, the DX version has all that's great about this remake of Namco's classic. Fundamentally, the underlying gameplay hasn't changed – eat dots, be chased by ghosts, eat pills, chase said ghosts yourself. Here, though, the graphics and sound have been amped up to eye-searing, ear-busting levels akin to a psychedelic experience, providing

a feast for the senses. Gameplay-wise, the levels are now varied, some with dots appearing ad-hoc throughout the level, others score attacking, as well as the usual clear-them-all levels. There are many more ghosts too, though that's not as bad as it sounds, because they are more the key to score accumulators than anything. Controls on the iPhone (sorry, no iPad) are decent for mobile, though not quite as taut as physical controls, plus it still isn't optimised for 16:9 screens. But, with no IAPs, it's a great game to buy and lose yourself in.

Space Invaders Evolved

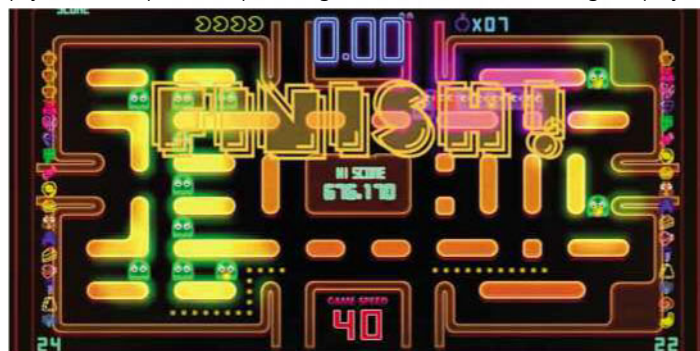
Another stone-cold arcade classic, *Space Invaders* has been given the remake treatment by Taito. Well, remake is maybe not giving it quite the justice it deserves, because the 'Evolved' title is very well deserved. Because *Space Invaders* is the daddy of all shoot-'em-ups, how else do you bring it into the modern era than as a retro-inspired bullet hell shooter? Gone is the blocky turret at the bottom of the screen (though it does make an appearance); we now have Ikaruga or Radiant Silvergun depicted in Teletext, the art style both retro in style and modern in its fluidity and imagination. Movement is free roam too, and with the automatic firing, the control feels great. Even if you're not a child of the 70s or 80s, such solid gameplay

is rewarding to anybody, as is the lure to chalk up a higher score.

Crossy Road

OK, so *Crossy Road* wasn't out in the 1980s for you to lose stacks of 10 pence coins to. But its spiritual ancestor most definitely was: *Frogger*. *Crossy Road* marries the simple idea of *Frogger* (guide a frog from the bottom of the screen, past layers of obstacles, to his lilypad at the top of the screen) with the mobile world's penchant for endless runners, and it's a combination that has struck gold. The design is very retro-inspired itself, looking like a moving take on the Activision Atari 2600 cartridge box art of the 80s – all sharp lines and bold colours. Like *Frogger*, the controls are also simple and lend themselves to one-finger play, so a tap jumps your chicken / pug / ghost / alien forward, and a swipe moves it to the left or right if needed. The control is *Mario*-style spot-on too; it makes you feel every mistake is your fault and not the game's. This and the high score bragging rights then feed into the one-more-go mentality like free spins on a fruit machine. Easy to play, and with easy to ignore IAPs, *Crossy Road* is brilliant fun and a deadly waste of time.

So there you go: arcade gaming is in rude health and still proves that even in this pick-up-and-put-down age of mobile gaming, and PCs and consoles with 4K textures, some games just never get old. Each of these games, despite their new makeovers, still have at their core the same fantastic gameplay that caused hundreds of millions of players to come back time and again. Try them, but be warned: you may find what starts out as a trip down memory lane at 7pm soon becomes one last go at 5am...



Perfection? At A Stretch

Andrew Unsworth says just because products don't get full marks, it doesn't mean they're not awesome

Most tech journalists are pretty value-focused when it comes to giving buying advice or recommendations, especially in magazines such as Micro Mart. However, that doesn't mean we're immune to the same giddy excitement and delight felt by everyone else when confronted with the next big thing, whether it's a nuclear-powered smartphone with a reactor so powerful that it'll last a full two days between charges or a laptop with a screen of such high-resolution that even falcons struggle to read text on it. Indeed, drop a searing hot slab of silicon semtex on our desks and it'll blow our stretched metaphorical legs off the same as it will anyone else's.

A good example of balancing 'WOW!' with value is the original Lenovo Yoga, a seemingly normal touchscreen laptop that could be twisted back on itself so that it became a rather large Windows 8 tablet. You could feel the keys on the back when you used it in tablet mode, which felt a bit odd (the keyboard was turned off in this mode, so there was no danger of accidentally typing something). It also eschewed typical laptop conventions on colour, being a bright orange rather than a sleek silver or aluminium, yet it was impossible not to like it.

Many reviewers gave the original Yoga four stars or a similar mark in whatever scoring system they used, which is fair enough. The keyboard could have been better, there were few

connection ports due to its fairly slim nature, and its processing power was considered to be pretty good but not amazing. There were similarly priced laptops contemporaneous with the original Yoga that were demonstrably better in objective benchmark tests and more subjective tests such as the perceived quality of construction, keyboard and touchpad. Yet when I asked tech journalists from the release of the original Yoga to the release of the even better Yoga 2 what their favourite laptop was, they'd say the Yoga. Well, that or the MacBook Pro or Air.

Sure the Yoga wasn't perfect, but there was something wonderful in the simplicity of its hinge, the boldness of its colour and Lenovo's confidence in the future of computing and the changing way its consumers

wanted to use technology. Other manufacturers had also created hybrid or 'convertible' laptops, yet none had done it so simply or with such style and panache. Many were too heavy, with complicated mechanisms for turning a common or garden laptop into something yuppies could use to shame their neighbours into social submission when impeccably behaved kids, an Aga Rangemaster Classic Deluxe and a Smeg fridge just wasn't enough. The positives of the Yoga far outweighed the negatives for many users and elevated it above other laptops.

Why do I mention this? I was reminded of it recently when a fellow journo pulled out a Yoga 2 and described it as the best laptop ever made. I couldn't agree with him, but only because, for me, the Yoga 2 has been eclipsed by the Yoga 3.



Andrew Unsworth has been writing about technology for several years, he's handy with a spanner, and his handshaking skills are second to none

Hardware



Ryan Lambie has loved videogames since he first stared up in awe at a *Galaxian* arcade cabinet in his local chip shop. 28 years on, Ryan writes about gaming for Micro Mart. He's still addicted to chips and still useless at *Galaxian*

Gaming

In The Forest Of The Night

One of the most beautiful platform games yet made? Quite possibly... Ori And The Blind Forest combines the pace of Metroid with the tone of a Studio Ghibli movie

This week, Ryan takes a look at the sumptuous platform game Ori And The Blind Forest, and checks out the changes in store for The Elder Scrolls Online...

Plug & Play

The platform genre is almost as old as gaming itself, and the classic, 2D variety is still nurtured and explored by indie developers today. *Ori And The Blind Forest* is one of the most exciting platformers on the horizon. In fact we'd go so far to say that, in terms of music and visuals, it's one of the most captivating we've yet seen.

Adopting a 2.5D, hand-painted look akin to Ubisoft Montreal's *Child Of Light*, what's notable about *Ori* is the sheer quality and detail of its animation. It's developer, Moon Studios, has apparently spent almost four years building and polishing the game – and it shows. Its lush forest environments are composed from layer upon layer of 2D art and lighting effects, creating a sense of painterly intimacy and depth. Moon Studios' website describes Japanese animation house Studio Ghibli as an influence, and this can be readily seen in *Ori*'s magical, melancholy landscapes.

The game itself is influenced by such free-roaming platform classics as *Metroid* and *Castlevania*, with a hint of *Legend Of Zelda* adventuring and light RPG elements. You take control of Ori, an orphaned guardian spirit intent on saving

his dying forest, who sets off on a sprawling adventure through a series of enchanted landscapes.

Although *Ori*'s trailer might hint at a gentle bout of whimsy, the visuals are matched by a tough, old-school edge; Ori can attack enemies by spitting globes of energy, and the platforming action looks as though it could provide a stern challenge akin to the infamously brutal *Super Meat Boy*. A recently-released gameplay trailer shows off an intriguing mechanic in one of its areas, where enchanted blocks alter gravity, allowing you to run up walls and along ceilings, or traverse dangerous areas by floating from platform to platform. Each of the game's locations, it seems, will introduce new mechanics like this.

Given a strong push by Microsoft – Ori is set to appear on Xbox One as well as PC – the game was one of the most talked-about games at last year's E3. What's most remarkable is that the team behind it is, by the standards of most major development studios, quite small. A core staff of nine people, scattered around the world, have been collaborating on *Ori* via the internet.

Originally scheduled for release late last year, *Ori And The Blind Forest* was pushed back to

the 11th March 2015 to allow for a bit of last-minute fine-tuning. A beguiling amalgam of traditional platformer, modern graphics and lyrical storytelling, the game looks as though it'll be well worth the wait.

Online

Released last April, *The Elder Scrolls Online* was a logical progression for one of the most respected RPGs in gaming. Although reviews were positive rather than ecstatic, it received a decent amount of support from players; a report in October 2014 suggested that around 1.2 million people had subscribed to the game.

That subscription model, the game's director Matt Firor told CVG in 2013, was a vital part of keeping the game fair and balanced. "Charging a flat monthly (or subscription) fee means that we will offer players the game we set out to make, and the one that fans want to play," Firor said. "Going with any other model meant that we would have to make sacrifices and changes we weren't willing to make."

On the 21st January 2015, however, Bethesda announced that it would be dropping Elder Scrolls' £10 monthly fee. Instead, revenue will



▲ *Elder Scrolls Online* is dropping its subscription fee. The move has caused some annoyance among players, while Bethesda insists it'll make the game one "fans will love to play"

be generated from in-game purchases and updates, while content packs will be sold as they're released. The old subscription still lingers on in voluntary form; something called an ESO Plus package will give users access to new content as it appears, as well as a couple of other perks – a pile of crowns (a currency that can be spent in a new in-game store) plus a "10 percent bonus to XP and gold gain, crafting research and inspiration."

In a press release coinciding with the announcement, Matt Firor returned to explain Bethesda's change of tactics. "Our fans are our biggest inspiration, and we've listened to their feedback on the

entertainment experience they want," Firor said. "We know that *Elder Scrolls* fans want choice when it comes to how they play and how they pay, and this is what they will get. We have made numerous changes to the game over the past year, and are confident this is a game that *Elder Scrolls* fans will love to play."

Inevitably, not all users are happy about the move, with some fearing that the new model will offer unfair advantages for those who pay for ESO Plus membership. "Even if they say the shop will purely contain cosmetic items, I can't believe them anymore," one user wrote on the game's forum. "I'm really disappointed by this announcement and I know it

can be done well, but I have a feeling from past experiences that it won't be."

On the other hand, the lack of subscription may prompt more players to take the plunge; indeed, some industry observers suggested that Bethesda planned to move from monthly payments to free-to-play from the very beginning. The publisher's enjoyed about a year of revenue from subscription-paying early adopters, and the recently-announced console release this June will likely see more players purchase the game and thus keep its profits at a healthy level. Only time will tell how greatly the changes to *Elder Scrolls Online*'s business model will affect the balance of its gameplay.

Incoming

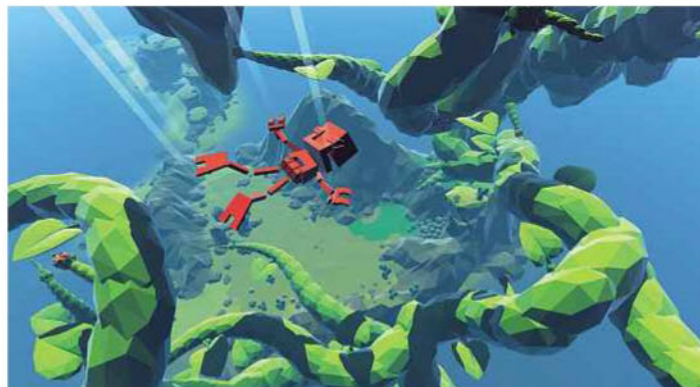
Ubisoft Reflections' quirky exploration game *Grow Home* should be available as you read these words. Set in a colourful, procedurally-generated world of flat polygons, the game sees you take control of BUD, a robot whose task is to grow gigantic plants, which provide

the planet with oxygen. As the plants grow kilometres up into the air, you have to climb from branch to branch, bouncing on leaves until you find precious seeds, which can then be sown to grow more plants. From what we can gather, climbing the plants affects how they grow – you are, Reflections says, "crafting your own playground in the sky."

"As you ride branching vines through the air," the studio's announcement reads, "you'll be shaping your own unique world, exploring new locations, and encountering strange plants and animals."

Grown Home began life as an experiment, that was only intended to be played in-house – but eventually burgeoned into this full commercial release. It's a surprising game from a developer better known for AAA titles like *Watchdogs*, *The Crew* and *Far Cry 3*, but it's also refreshing to see Reflections branch out with such a refreshingly different concept.

Grown Home is available on Steam from the 4th February. [mm](#)



▲ *Climb and grow gigantic plants and collect their seeds in Ubisoft Reflections' quirky adventure game Grown Home, out on the 4th February*

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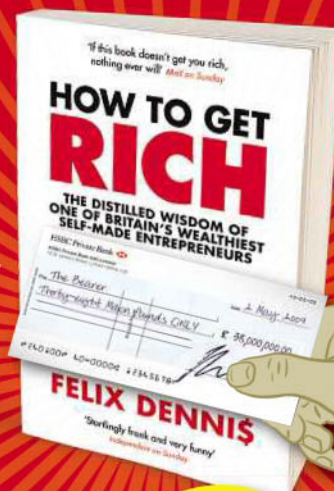
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Lian Li PC-X2000 Computer Case. Supports mATX, ATX, eATX; hot swap SATA drive compartment. Includes six 3.5" & two 2.5" hot swap disc holders. Three 140mm intake plus two 80mm and one 140mm exhaust fans.
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Please try to keep your queries brief and limit them to just one question per letter, simply so we can squeeze in as many as we can each week. Please include relevant technical information too.

Aaron

W10 For Free?

I've got a windows Vista PC, which I've had for some time, and so far I've been holding off on upgrading due to the OS costing so much money. I found out recently, however, that Microsoft is going to be giving Windows 10 to people for free as an upgrade. This interested me, as I understand that 8.1 fixed a lot of problems Windows 8 had, and 10 will be a better experience for all users, including stubborn mules like me.

My PC includes an Intel Core Duo 3GHz CPU and 4GB RAM, so am I right in thinking that this should be enough to run Windows 10?

Hamish

The specifications you've provided fall within the Windows 10 minimum requirements (which is essentially the same as Windows 8), so you shouldn't have any issues, providing you also have a DirectX 9 compatible GPU, which is likely. However, I doubt you'll

qualify for a free upgrade, as it's only available to Windows 7 and 8.1 users, as stated on the official website.

"We will offer a free upgrade to Windows 10 for qualified new or existing Windows 7, Windows 8.1 and Windows Phone 8.1 devices that upgrade in the first year!"

Some editions are excluded: Windows 7 Enterprise, Windows 8/8.1 Enterprise, and Windows RT/RT 8.1. Active Software Assurance customers in volume licensing have the benefit to upgrade to Windows 10 Enterprise outside of this offer. We will be sharing more information and additional offer terms in coming months."

“ I doubt you'll qualify for a free upgrade, as it's only for Windows 7 and 8.1 users ”

This also bears the caveat, "It is our intent that most of these devices will qualify, but some hardware/software requirements apply and feature availability may vary by device. Devices must be connected to the internet and have Windows Update enabled. ISP fees may apply. Windows 7 SP1 and Windows 8.1 Update required.

In short, you need to be a non-commercial user with Windows 7 or later – Vista is not included in the qualifying conditions, you'll need to upgrade before you qualify for a free copy of Windows 10.

▼ **Microsoft is giving users Windows 10 for free, but there are qualifying rules**

Windows 10 is not for all of us, but for each of us.

We are designing and developing Windows 10 differently from the way we've always done it. Millions of people are providing their feedback and helping us to shape the future of Windows.

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Great news! We will offer a free upgrade to Windows 10 for qualified new or existing Windows 7, Windows 8.1 and Windows Phone 8.1 devices that upgrade in the first year! And even better: once a qualified Windows device is upgraded to Windows 10, we will continue to keep it up to date for the supported lifetime of the device, keeping it more secure, and introducing new features and functionality over time – for no additional charge. Sign up with your email today, and we will send you more information about Windows 10 and the upgrade offer in the coming months.

[Sign up for email](#)

Still Can't Update

Whilst in the midst of trying to figure out how to get my Sony Vaio laptop (running Vista Business) to install 28 failed updates, I read your 'Unable to Update' response to 'Kel' in issue 1345 and whooped with joy. Then came the let-down. Microsoft's article kb971058 appears to apply to Vista (Windows 7 and earlier OS option), but neither of the two Vista Business laptops in my household include the Service 'appidsv' which left me uncertain as to how to proceed.

Further web searching indicates to me that 'appidsv' should be present, and various pay-for and free fixes are offered, there also appears to be a Microsoft diagnostic and repair tool. It all looks a bit of a minefield and I'm a bit suspicious of all those we'll fix your problems enticements, so I wondered if you could recommend a straightforward and appropriate method of repairing 'appidsv' in Vista.

As you'll have gathered I've neglected to create a system backup whilst I've had a good OS installation to copy.

I should add that both of those laptops were donated by respective sons and Vista was re-installed by others prior to my ownership. Both laptops are ex-business and have 3rd party Vista installations rather than the original OEM vendor supplied or pre-installed recovery OS.

Don

I'm sorry you've run into problems with the Windows Update solutions. The fix I provided initially does, indeed, apply to Vista, but as you seem to be missing the appidsv file, you'll be unable to use it, as you've found out.

You're wise to be suspect of various repair websites. There are many of these around, some of which offer a downloadable tool, and others an online scan of sorts, and not all are helpful, and there's always the worry of malware or viruses. For this reason, it's best to stick with official solutions, or trusted websites. Of course, if you can fix it yourself, all the better, so let's have a look at possible fixes you could use.

First, a clean of your system would be a good idea, including undertaking malware and virus scans. Also ensure you update drivers, and remove any unwanted programs. It may sound unrelated, but this really can help with these kinds of problems, and it's always good to start with a clean system before you troubleshoot specifics.



Microsoft

Next it would probably be prudent to run Windows' file checker, just in case you have issues with corrupt or damaged system files. So, ensure you have admin rights and then click Start and type 'cmd' and press Enter. At the command prompt, type 'sfc /scannow' and press Enter. Windows will now check its system files, which can take a while. Once done, it's best to reboot.

As the missing file is a .dll (Dynamic Link Library), it's a good idea to check

Once done, reboot and try to update Windows again.

Sometimes, in rare cases, problems can be caused by some recent drivers, and one way to remedy any issues is to roll back your drivers to older versions. If you recently updated any drivers (apart from the update I advised here), try rolling them back.

Ideally, if you have a system restore point from a period when Windows

“ It's best to stick with official solutions, or trusted websites. Of course, if you can fix it yourself, all the better ”

to see if the file simply isn't registered. If so, a manual registration will remedy the problem. To do this click Start and then Run. In the text box, type 'regsvr32 /u appidsvc.dll' and press Enter. This will unregister the file, in case there was something wrong with the previous registration. Now, repeat the process, but type 'regsvr32 /i appidsvc.dll'. This will re-register the file. For good measure, reboot your PC, and once that's done, try running updates again to see if the problem is solved.

Your problem may lie with the system Registry, often a cause of similar issues. This can sometimes be fixed with a Registry cleaner. Of course, these cleaners can be a benefit, but can also cause problems, so it's best to take precautions, mainly by backing up your Registry, and any important data. To back up the Registry, open the editor by clicking Start > Run and typing 'regedit' and pressing Enter. Next, click File, Export and give the backup a name and place to save to. Also select 'All' from the Export Range option, to export the whole Registry.

Next, use a popular and respectable Registry cleaner, such as CCleaner (www.piriform.com). Run the program to clean the Registry by following its instructions.

Update worked, you could try this, as it would undo any changes made to your system, including driver updates.

It's a shame you don't have an actual copy of Vista to hand, as a repair install would be a good idea if the above doesn't work. If you can get hold of a copy, give this a go, as it will refresh system files from the disc.

▼ It's always best to use 'fixit' tools from trusted sources, and to avoid any you're not sure about



ASK JASON



Meet Jason D'Allison, a veteran of Micro Mart's panel of experts. He's here to help with any technical questions, including anything to do with tablets or smartphones, as well as PCs

Send your questions to:
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Dennis Publishing
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Contact Jason by email at:
jason@micromart.co.uk

While we try to cover as many questions as we can, we regret that Jason cannot answer your questions personally, but he'll cover as many as he possibly can each week. Please ask one question per letter and remember to include the full specification of your computer, including its operating system.

Jason

Serial Killer

For years my Windows XP desktop has suffered from lock-ups. And this week, after all this time, I've discovered they only occur when I've hooked up a USB hard drive. Normally I use a mains-powered 3.5" unit, but I've confirmed that a port-powered 2.5" unit causes the same problem. It makes no difference which USB port I use.

Is the PSU at fault? That seems unlikely, as the mains-powered drive surely puts almost no load on it. What about the USB controller or its driver? It's true the PC's 14 years old, with the original PSU and motherboard. I know it's time to ditch XP, and a new build is being planned, but at the moment, if I tax the USB ports only long enough to back up new files, I'm finding I can get by.

Don Dobson, Gmail

I'm going to say what I always say: it's the motherboard. I'll stake my Carry On box-set on it (Carry On Emmanuelle's missing, but that's a blessing). USB problems are common, especially as boards get older. As you suggest, the fault here probably relates to the controller (which could be part of the chipset's southbridge) – a solder break in one or more of the pins, perhaps, or a crack in a copper track. I expect there's only the one controller, so the fault's affecting every port (four?).

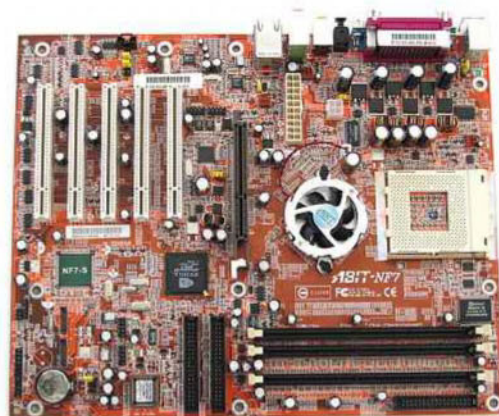
An outside bet is the PSU. It's as old as the hills, and I rather suspect it's a bargain-bucket job that weighs barely more than a bag of Doritos (Chilli Heatwave, naturally). Forgive me if I'm wrong, Don.

If you can, try another. If the lock-ups persist, the finger's back to pointing at the motherboard.

I imagine the board in question uses Socket A or Socket 478 – those were the top-end interfaces around 2001. We could even be talking about USB 1.1. A second-hand replacement might end up being just as flaky as what you're already running, so my advice is to pick up a USB 2.0 PCI card. A four- or five-port job should cost £5 at most. Stop using the board's own ports completely – I imagine you'll get lock-ups no matter what you connect to them.

Or you could lay your current PC to rest and put the pedal to the metal on that new build...

▼ *In its day, Socket A was the dog's, especially in the shape of the legendary Abit NF7-S*



A Call For Small

I want to build a mini-ITX gaming rig. I'm looking at motherboards featuring an integrated J1900 Celeron or J2900 Pentium (both quad-core and fanless). Are these CPUs up to scratch? Also, I need a board with a PCIe x16 graphics slot, but I can't find one. Can you point me in the right direction?

Louis, Gmail

Those are Silvermont chips. They're entries in Intel's new Atom range, though the laptop models (Bay Trail-M) and desktop models (Bay Trail-D) carry the Celeron and Pentium monikers. Do they cut the mustard for gaming? Well, clock-for-clock, performance is similar to that of the old Core 2 Duos. That's impressive when the power-draw's just 2W to 10W, but it's still low-rent by today's standards.

Furthermore, Silvermont chips only have four PCIe lanes, and they're compliant only to PCIe 2.0, not PCIe 3.0. Now, it's quite possible to wire up four PCIe lanes to a x16 slot, but under PCIe 2.0 even a mid-range graphics card would be nastily bottlenecked. No Silvermont motherboards take

this path. They all feature a PCIe x1 slot or a plain old PCI slot.

For a small gaming rig, Louis, look instead at LGA 1150 boards. You could then fit, say, an energy-efficient Core i3 (it won't be fanless, though). Such boards do exist in the mini-ITX form factor, and some feature a full PCIe 3.0 x16 slot. The slot will be right on the edge of the board, mind, so a double-width graphics card will overhang. Be careful in your case choice!

▼ *ASRock's Q2900-ITX could well be the most powerful fanless all-in-one mini-ITX board currently on sale*



Play Your Cards Right

I've recently upgraded from a Galaxy S II to a Galaxy Note 4. I want to supplement the 32GB of internal storage with a micro-SD card, but what exactly do I need? I see cards with all these different markings – numbers in circles, Roman numerals, MB/s ratings – but I've only the vaguest understanding of what they mean.

Ray, TalkTalk

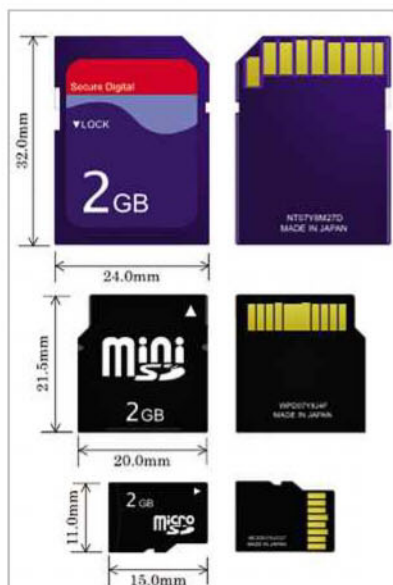
Good old SD (Secure Digital) – the memory card for all seasons. As you've found, though, the specs have been added to so many times over the years, making sense of them can be a real struggle. So here's a no-nonsense overview.

First, SD cards come in the following physical sizes – see the accompanying image for actual dimensions. Cheap adaptors are available to allow a smaller card to fit into a slot designed for a bigger card.

- **SD (full-size):** used in big items (laptops, DSLRs)
- **Mini-SD:** obsolete, but still used in some cheap Chinese items
- **Micro-SD:** used in small items (phones, compact cameras)

Next, every SD card bears one of the following abbreviations. This indicates how 'modern' the card is – which generation of specs it follows, which type of slot it requires, and the maximum possible capacity.

- **SDSC (originally just SD):** 1MB–2GB (some 4GB cards exist)
- **SDHC:** 4GB–32GB



▲ It's staggering to think that 128GB of data can be held on a micro-SDXC card

- **SDXC:** 32GB–2TB (currently 512GB is the biggest capacity)

There are also three bus protocols, denoting the maximum possible transfer speed. If a card doesn't specify the bus, it's the 'standard' one. The UHS buses are pretty new, and the required slot support – especially for UHS-II – is only now taking off.

- **'Standard':** up to 25MB/s
- **UHS-I (only applicable to SDHC and SDXC):** up to 104MB/s
- **UHS-II (as USH-II):** up to 312MB/s

Every card also carries a speed classification. This defines the minimum guaranteed sustained write speed (the read speed will usually be higher). U1 and U3 apply only to cards using either of the UHS buses (so they're never used on SDSC cards). A card may also state its maximum burst rates (sustainable only for a short time), a factor the SD specs don't cover.

- **Class 2:** 2MB/s
- **Class 4:** 4MB/s
- **Class 6:** 6MB/s
- **Class 10:** 10MB/s
- **U1:** 10MB/s
- **U3:** 30MB/s

To see which types of card will work in which types of slot, Ray, take a look at the second accompanying table. In general, cards are forwards-compatible but not backwards-compatible. For example, an SDSC card will work in an SDSC, SDHC, or SDXC slot, but an SDHC card, whilst compatible with SDHC and SDXC slots,

won't work in an SDSC slot (even at reduced capacity). Thankfully, UHS cards run as standard Class 10 cards when used in non-UHS slots, and UHS-II cards run as UHS-I cards when used in UHS-I slots.

As for your Note 4, this supports micro-SDXC cards at up to 128GB (and probably 256GB cards and beyond once they become available). Also, it **appears** to support UHS-I. Samsung doesn't say, but UHS-I is certainly a feature of the UK Note 4's SoC (system-on-a-chip), Qualcomm's Snapdragon 805. Both U1 and U3 cards should therefore work at their full sustained write speeds, but it's unclear if the 805's UHS-I bus is capable of the top 104MB/s rate or just the base 50MB/s rate. The burst speeds of fast cards **might** be impacted.

What card should you buy? Well, if you'll be using it merely for taking photos and playing back music and movies, even a Class 2 job will probably suffice. However, the Note 4 can shoot 4K video at 30fps, and that requires a sustained write speed of about 6.25MB/s. Even there, a standard Class 10 card should be ample – no need for UHS at all (but it won't do any harm). Buy as many gigabytes as you can afford, and stick to known brands and reliable sellers (lots of fake cards are in circulation).

► If all those numbers and symbols make you dizzy, hopefully my SD overview will clear your head



	SDSC card	SDHC card	SDHC UHS-I card	SDHC UHS-II card	SDXC card	SDXC UHS-I card	SDXC UHS-II card
SDSC slot	Yes	No	No	No	No	No	No
SDHC slot	Yes	Yes	Yes	Yes	No	No	No
SDHC UHS-I slot	Yes	Yes	Yes	Yes	No	No	No
SDHC UHS-II slot	Yes	Yes	Yes	Yes	No	No	No
SDXC slot	Yes	Yes	Yes	Yes	Yes	Yes	Yes
SDXC UHS-I slot	Yes	Yes	Yes	Yes	Yes	Yes	Yes
SDXC UHS-II slot	Yes	Yes	Yes	Yes	Yes	Yes	Yes

▲ Ooh, look at that – a handy table showing which SD cards will work in which slots [adapted from Wikipedia]

Crowdfunding Corner

Smartphone attachments abound in this week's Crowdfunding Corner. One takes pictures out of the digital world and into the real one, while the other does the opposite for you!

Prynt Instant Camera Case

The polaroid camera occupies a unique spot in people's imaginations, so it's no surprise that in a word of near-ubiquitous digital photography, companies turn to it for inspiration. Unfortunately, most people don't want to carry a separate camera around with them at all times. That's what makes the Prynt Instant Camera case so intriguing: it's a photo printer that attaches to the camera you already use: your phone.

The Prynt can print newly-taken photos or ones from a variety of online sources, and its modular case allows it to fit a wide variety of phone makes and models, with compatibility for Android and iOS included. It's available in several colours with stylish, patterned grips, and you don't have to worry about ink levels – the special paper (which you can order through the app) has the ink already embedded in it.

Interestingly, it also comes with augmented reality features. If you take a photo through the app, it records a short video of you which anyone can access in the cloud by holding their phone over the print. Futuristic!

Early bird tiers are long-gone, we're afraid, but you can get a Prynt unit with 10 sheets of paper for \$99 (£65). It comes with an 50 additional print sheets for every \$25 (£16.50) you add to your pledge. Shipping to the UK is just \$15 (£9.80).

URL: kck.st/15Fjvoz

Funding Ends: Tuesday, March 3rd 2015

VISR 3D Headset

After the Oculus Rift captured the technology industry's imagination, and scooped up a whole big wedge of Mark Zuckerberg's cash, 3D headsets became the next big thing on Kickstarter. However, alongside the cutting edge approach, there developed a branch of left-field thinkers that started developing attachments for your smartphone that could provide a similar experience for a fraction of the price.

Now, Kickstarter's crawling with those as well. So, what makes this one different? Well, it's based in the UK, so that's not a bad reason to support it. It's also nice and cheap – just £15.

That's probably because it's based on similar principles to the Google Cardboard headset, but unlike Google Cardboard you don't have to assemble it yourself or buy any components. All you have to do is load up a game or movie that supports 3D visors, slip your phone into the top of the device, and then strap it your face – *et voilà!* Virtual worlds become yours in an instant.

The goal of the Kickstarter is to produce the headset on a large scale, and at £15 a unit it's not going to break the bank. Unfortunately it's looking like a long shot to hit its goal – it's only raised £7k of a £25k total at time of writing – but don't let that stop you having a look and getting involved. Who knows what might happen in those last few days?

URL: kck.st/1DKsGT8

Funding Ends: Friday, February 6th 2015



Disclaimer: Images shown may be prototypes and Micro Mart does not formally endorse or guarantee any of the projects listed. Back them at your own risk!

App Of The Week

Picture Collage Maker

David Hayward gets to grips with all those pictures he took of last year's party

We often have a number of pictures we want to display in a frame, like after we've come back from an event or from a birthday party, for example. Rather than having multiple frames with a picture of each, we prefer to display a select number of pictures in the form of a collage. This way we can get everyone in the frame, and we can capture the 'feel' of the event.

Furthermore, there are times when we want to make a better than average calendar, greetings card, poster, etc. While Publisher does a reasonably good job, it often lacks the templates and functionality to make a really good collage.

Go with the Pro

Picture Collage Maker Pro, from PearlMountain Technology Co, has the perfect solution for the making of excellent-looking collages.

The software itself costs \$39.90 (roughly £26), and within you'll find an enormous selection of templates, backgrounds, layouts, frames, clip art and custom shapes to help you create something a little more interesting than the usual collage affair.

With the Collage template itself, you'll find many design layouts, ranging from

a family tree, magazine cover layout and photo walls, through to postcards and yearbooks. The Comic template contains the layouts for a more Marvel/superhero type of design, through to a more stylistic black-and-white print approach.

Of course, once you have the template you're interested in, it's a relatively easy job to populate it with the images you want to include. With each of the templates, you'll have the artwork, along with picture frames, which you can simply drop the photo of your choice into, and this will then snap into place.

From there you can then apply all manner of shapes, clipart, frames and borders to further personalise the design. Plus you also have the opportunity to download more templates and designs through the PearlMountain resource site, which features a wealth of add-on packs.

All in all, there's plenty to delve into within the inner workings of Picture Collage Maker Pro. And even if you don't fancy using any of the pre-installed or downloadable templates and designs, you can always opt to create one yourself using the blank page maker and your own set of images, clipart and frames.

Conclusion

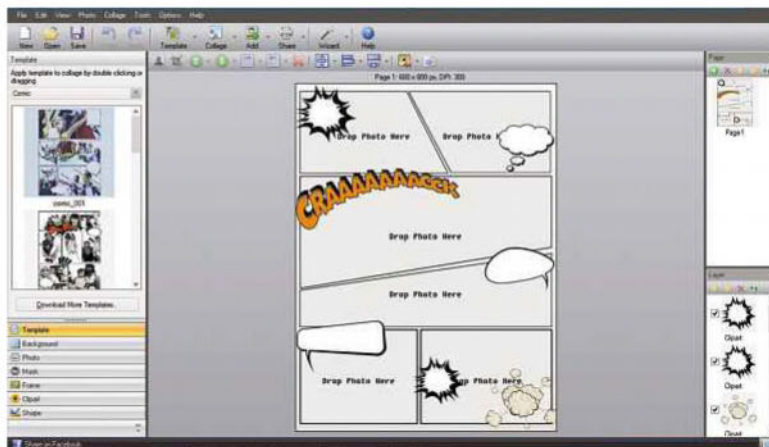
We were quite pleased with Picture Collage Maker Pro. It's a straightforward interface, with loads of helpful prompts and tips, and although you're importing a number of pictures into a template, it remains a neat setup that's free from clutter.

So the next time you fancy putting together a mixture of images or you want to make a seasonal greetings card that will rival that of Tony Blair's offering, then give Picture Collage Maker Pro a demo and see what it can do for you.

For more information, visit the PearlMountain site at goo.gl/5FBSxi.

Features At A Glance

- Loads of templates and designs.
- Straightforward, clutter-free, drag-and-drop interface.
- Decorate your finished design with clipart, frames and other embellishments.
- More downloadable add-ons and packs available.



▲ You can create some pretty nifty collages from the many templates available



▲ Or you can opt for your own unique designs

Logging Off

Last week, I concluded, ahead of the Microsoft Windows 10 announcement that any encouragement to switch to its new release would undoubtedly be stick and not carrot shaped.

But I'm happy to report that the world isn't devoid of surprises, even for wizened old hacks like me. If its presentation is to be fully believed, and there aren't any subtle gotchas, it's come back from its latest fiasco wielding something distinctly carrot coloured.

I wrote a feature some months ago where I discussed the various Windows 10 upgrade scenarios, and the one Microsoft appears to have gone with I described then as the 'better together campaign'. In this, Windows 8.x and 7 users are anointed with a new release for free, and those in Microsoft HQ turn the music up loud to drown out the squealing of the spooked finance department.

The strategy is to eliminate a major part of the Windows fragmentation problem at source, although that generosity doesn't quite extend to the huge number of XP users.

I took this news as the first indication from Microsoft of what a deep, deep hole it's gotten itself into – and, by the same account, what drastic measures it's prepared to take to get itself out.

When you consider how much money the Windows division pulls in over a typical year, offering Windows 10 free to Windows 7 and 8.x users is a huge deal however you slice it. Typically Windows makes Microsoft a profit of about \$9 billion on revenue of \$19bn. At least, it did in 2013, the year it launched Windows 8.

The problem with making Windows 10 free is that while it might help Windows 8 (and 7) numbers now, there will be a whole year after launch where almost nobody will buy it.

Yet the pain isn't all Microsoft's, because it will be well shared out with the PC industry as a whole, even if they didn't sign up to this.

By implication, if Windows 10 is a free upgrade to Windows 7, then it will run on a PC that was designed to handle that OS. Therefore, there is almost no reason to buy a new PC, especially when you get the OS upgrade for free on your old kit.

That could kill new PC sales entirely, if they weren't already soft enough. What it will do is help keep Windows relevant in space that's finally realised that having a Windows desktop or laptop isn't

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'all that', and proper alternatives do exist.

It's a huge gamble, because the more that people get things for free, the much more difficult it will be to get them to spend on it at some later point. Alternatively, that may be the point, and Microsoft is throwing in the towel on making money from operating systems completely? That might make a few investors spit their cornflakes out, if it's true.

If the bridges between the company and its partners in the hardware market weren't still smouldering from the Surface conflagration, they'll be fully alight now.

However you interpret these events (and the devil is invariably in detail we've yet to see), 2015 is already a significantly more interesting year than 2014 was, and it's barely February.

Buckle up, Dorothy. Things could get bumpy from this point on.

Mark Pickavance

LAST WEEK'S CROSSWORD

Across: 7 Modus Operandi, 8 Aghast, 9 Volume, 10 Filofax, 12 State, 14 USBWL, 16 Measure, 19 Acidic, 20 Panama, 22 Crowdsourcing.

Down: 1 Korg, 2 Fugato, 3 SoftRam, 4 Verve, 5 Tablet, 6 Odometer, 11 Insecure, 13 Helpout, 15 Widows, 17 Sonics, 18 E-Cash, 21 Mint.

DISCLAIMER

The views expressed by contributors are not necessarily those of the publishers. Every care is taken to ensure that the contents of the magazine are accurate but the publishers cannot accept responsibility for errors. While reasonable care is taken when accepting advertisements, the publishers cannot accept any responsibility for any resulting unsatisfactory transactions. They say you learn something new every day, so that must mean you learn at least seven new things every week. We'd like to test that theory right now but coming up with seven things we learned this week. Lesson one: we learned that comparing your bald friend to the snooker player Peter Ebdon won't elicit any kind of positive response from his wife. Lesson two: we

discovered that she gets just as annoyed if you compare her spouse to Richard O'Brien. Lesson three: we realised that the once-awesome graphics card in our PC is now getting a bit long in the tooth and is teetering dangerously close to being rubbish. Lesson four: we found out that Paris Hilton was one in an episode of the TV show Supernatural. Lesson five: we were enlightened with the fact that a £30 shoe storage unit from Argos weighs 19kg. Lesson six: we realised we'd run out things to write in this list, so the whole theory about learning something new every day must be a lie. So there you go: hard evidence to proof that you probably only learn something new every other day or so, and that what you learn probably isn't worth knowing anyway (if you're like us, anyway).



THIS WEEK'S CROSSWORD

Across

7 A sequence of reciprocal cause and effect in which two or more elements intensify and aggravate each other, leading to a worsening situation. (7,6)

8 .mx TLD. (6)

9 A legendary Pokémon in Pokémon Ruby, which can only be caught in the Island Cave once in each game. (6)

10 Produced under conditions involving intense heat. (7)

12 A spherical representation of the earth or of the constellations with a map on the surface. (5)

14 In a potentiometer, it refers to how the resistance varies as the pot's armature is rotated. (5)

16 Discourse that surrounds a language unit and helps to determine its interpretation. (7)

19 A plug-n-play peripheral device interface, typically for laptop computers. This term was generally replaced by PC Card around 1995. (Abbr) (6)

20 Survey goods for sale in a leisurely and casual way. (6)

22 The co-option of another person's personal information for fraudulent use without that person's knowledge. (8,5)

Down

1 Use this program to run Windows software on Linux. (4)

2 Bounded or limited in magnitude or spatial or temporal extent. (6)

3 A device that displays words for broadcasters to read. (7)

4 A 21-pin connector commonly used in Europe to interconnect satellite receivers, television sets and other audiovisual equipment. (Acronym) (5)

5 Sparing or economical as regards money or food. (6)

6 Popular term for the equipment that records information about the performance of an aircraft during flight. (5,3)

11 A numerical system used in computing in which consecutive integers are represented by binary numbers differing in only one digit. (4,4)

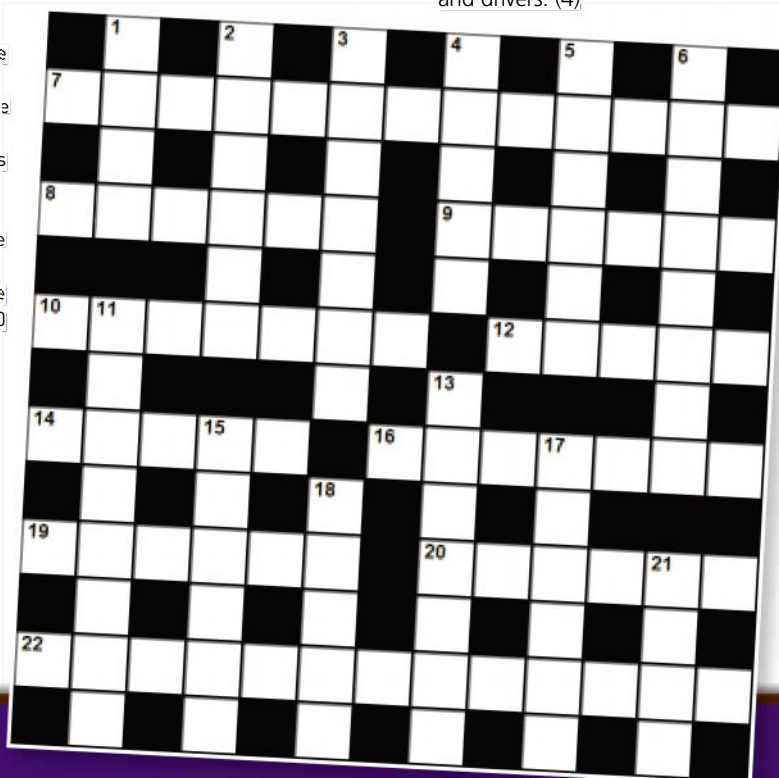
13 Dishonest or careless people in business, especially unqualified ones. (7)

15 Relating to or denoting the second epoch of the Tertiary period. (6)

17 A symbolic reward for a specific achievement. (6)

18 Having a sound basis in logic or fact. (5)

21 A diagnostic mode to start Windows with a limited set of files and drivers. (4)



In Next Week's Micro Mart*

- Trading in your old technology, and how to get the best price
- Getting to grips with Chrome Remote Desktop
- Upcoming vapourware: the great products that might never be
- Plus the usual mix of news, reviews and advice



* May be subject to change

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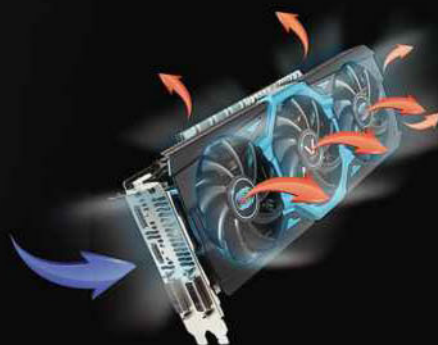
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Bitdefender	5.91
Kaspersky	5.76
Symantec	5.50
McAfee	4.35

Best Protection Against Infections

(on a scale of 0 to 6 and 6 being the **highest protection**)
www.av-test.org

Overall Score, January 2011 - January 2014, AV-TEST

Bitdefender	5.3
Kaspersky	5.0
Symantec	4.0
McAfee	2.9

Lowest Impact on Performance

(on a scale of 0 to 6 and 6 being the **lowest impact**)
www.av-test.org

Overall Score, January 2013 - January 2014, AV-TEST

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